

# EPSON®

## User's Guide



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The KGB/CIA World Factbook CD-ROM game included with your system is an newer version of this game then the one installed on your computer's hard disk drive. To install this game correctly in Windows please follow the instructions given below:

### **Removing the Existing KGB/CIA World Factbook from the Hard Drive**

1. Exit to Windows Program Manager by clicking on the **EXIT** button on the right side of the FocalPoint screen.
2. From The Program Manager window open the **FILE** menu and select **EXIT WINDOWS**.
3. At the C:\> prompt type the following: **Deltree C:\KGBCIA** then press **Enter**.
4. Press Y then press **Enter** to answer the question **Delete directory "kgbcia" and all its subdirectories? [yn]**
5. Reboot your computer.

### **Reinstalling KGB/CIA World Factbook**

1. Exit to Windows Program Manager by clicking on the **EXIT** button on the right side of the FocalPoint screen.
2. Place the KGB/CIA disk into the CD-ROM drive.
3. From The Program Manager window open the **FILE** menu and select **RUN** option.
4. In the Command Line, **type D:SETUP** and press **Enter**.
5. The installation will begin. You will be asked on which drive and directory you want the software installed. To choose the default setting, press **Enter** or click **Continue**.
6. The Necessary files will now be installed onto your hard drive.

When the installation process is done correctly you will see a new group called "M.O.S.T." in the Windows Program Manager.

### **Installing the Program in FocalPoint**

To Setup KGB/CIA World Factbook in FocalPoint please follow the instruction given below.

1. Single click on the **SETUP** button on the right side of the FocalPoint screen, this will activate FocalPoint **SETUP**.
2. Single click on the KGB/CIA World Factbook icon.
3. In the Command Line, **type C:\KGBCIAMOST.EXE KGBCIA.INI**.
4. Click on the **Icon** button, in the File Name area **type C:\KGBCIA\MOST.EXE**, then click on the **OK** button. Click on the **OK** button one more time to go back to FocalPoint main menu screen.
5. To deactivate FocalPoint SETUP single click on the **SETUP** button again. This will complete the KGB/CIA Setup process in FocalPoint.

### **Loading the Program in FocalPoint**

To load the KGB/CIA World Factbook (M.O.S.T.) Windows software from FocalPoint, single-click on the KGB/CIA World Factbook program icon.

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# Update

This update revises the *Read This First* booklet that came with your computer. In addition to the multimedia software listed in that booklet, your computer also comes with these multimedia programs:

- ❑ Interplay™ Battle Chess® game software on CD  
Technical support: (714) 553-6678  
Fax: (714) 252-2820  
BBS: (714) 252-2822
- ❑ Paramount Interactive Lenny's MusicToons™ game software on CD  
Technical support: (415) 813-8030  
Fax: (415) 813-8045

This update tells you how to use Microsoft® Windows™ to install these programs on your computer's hard disk drive and how to create buttons for them in the EPSON® FocalPoint™ Windows environment program. *See* your *Read This First* booklet, your Windows documentation, and the on-line help utilities for in-depth information on using Windows and FocalPoint.

For information on using Battle Chess and Lenny's MusicToons, see the program's README file or on-line help utility, or contact the manufacturer at the numbers listed above.

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## Installing Battle Chess

To install Battle Chess using Windows, follow these steps:

1. Start the Windows Program Manager.
2. Insert the Battle Chess CD into the CD-ROM drive. Then wait for the green light on the CD-ROM drive to light up.
3. From the File menu, select Run.

4. Then select Browse.
5. In the Drives dialog box, select drive D: to specify your CD-ROM drive.
6. In the Directories box, select the MPCCHESS directory.
7. In the File Name box, select setup. exe. Then select OK.
8. You see the Battle Chess installation screen. Follow the instructions on the screen to accept the suggested directory and select Continue.
9. The installation program copies the files from the CD to your hard disk drive and creates the Battle Chess group and program icon in Windows. When the installation is complete, you see a confirmation message. Select OK to continue.
10. Your computer automatically starts Battle Chess. Make sure you hear the sound the program produces and can select items on the screen to test it. Then select Exit from the File menu to exit the program.

## ***Adding Battle Chess to FocalPoint***

To add a program button for Battle Chess in the FocalPoint program, follow these steps:

1. Start FocalPoint and select the Games program group.
2. Go to page 2 of the Games group.
3. Select the Setup control button (with the wrench icon) on the right side of the screen. The Setup bar appears on the left side of the screen and empty program buttons appear in the program icon selection screen in the middle.
4. Select one of the empty program buttons. You see the Button Properties dialog box.

5. In the Title field, type Battle Chess
6. Move the cursor to the Command Line field and select the Find Program button.
7. In the Drives box, select drive D :
8. In the Directories box, select the MPCCHESS directory.
9. In the File Name box, select mpcchess . exe. Then select OK.
10. You see the Button Properties dialog box. FocalPoint Setup automatically fills in the Working Directory box and selects the Battle Chess icon. Select OK.
11. Select the Setup control button again to exit FocalPoint Setup.

Now Battle Chess is installed in Windows and in FocalPoint

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## ***Installing Lenny's Music Toons***

To install Lenny's MusicToons using Windows, follow these steps:

1. Start the Windows Program Manager.
2. Insert the Lenny's MusicToons CD into the CD-ROM drive. Then wait a few seconds for the CD to initialize.
3. From the File menu, select Run.
4. Then select Browse.
5. In the Drives dialog box, select drive D : to identify your CD-ROM drive.
6. In the File Name box, select install. exe. Then select OK.
7. You see the program's installation screen. Follow the instructions on the screen to install the program and continue.

8. The installation program copies the files from the CD to your hard disk drive, creates the Lenny's MusicToons group, and creates Lennys' MusicToons, Sound Test, and Read Me program icons. When the installation is complete, you see a confirmation message. Select OK to continue.
9. You see a prompt asking if you want to view the program's README.DOC file. Select Yes or No.
10. When you see the Lenny's MusicToons program group, select the icon to run the program and test it. Make sure you hear the sound the program produces and can select items on the screen. Then exit the program.

### ***Adding Lenny's Music Toons to FocalPoint***

To add program buttons for Lenny's MusicToons in the FocalPoint program, follow these steps:

1. Start FocalPoint and select the Games program group
2. Go to page 2 of the Games group.
3. Select the Setup control button (with the wrench icon) on the right side of the screen. The Setup bar appears on the left side of the screen and empty program buttons appear in the program icon selection screen in the middle.
4. Select one of the empty program buttons. You see the Button Properties dialog box.
5. In the Title field, type Lenny's MusicToons.
6. Move the cursor to the Command Line field and select the Find Programbutton.
7. In the Drives box, select drive D :
8. In the File Name box, select lenny . exe. Then select OK.

10. You see the Button Properties dialog box. FocalPoint Setup automatically fills in the Working Directory box and selects the Lenny's MusicToons icon. Select OK.
11. Repeat steps 4 through 10 to create the Sound Test button substituting the following information:
  - ☐ In the Title field, type Sound Test.
  - ☐ In the File Name box, select lensnoop. exe.
12. Repeat steps 4 through 6 again to create the Read Me button substituting Lenny's Read Me in the Title field.
13. In the Drives box. select drive C :
14. In the Directories box, select the windows directory.
15. In the File Name box, select notepad. exe. Then select OK.
16. You see the Button Properties dialog box. Move the cursor to the end of the command in the Command Line field and type `c:\lenny\readme.doc`.
17. Now select the icon shown in the Icon box. In the dialog box, select the following:

Drive :            c :  
Directory: windows  
File Name: \*.exe

18. Then select the file notepad. exe when the \*.exe files are listed.
19. Select OK.
20. Select the Setup control button again to exit FocalPoint Setup.

Now all the components of Lenny's MusicToons are installed in Windows and in FocalPoint.

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EPSON Connection is a service mark of Epson America, Inc

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# Important Safety Instructions

Read all of these instructions and save them for later reference. Follow all warnings and instructions marked on the computer.

- Unplug the computer before cleaning. Clean with a damp cloth only. Do not spill liquid on the computer.
- Do not place the computer on an unstable surface or near a radiator or heat register.
- Do not block or cover the openings in the computer's cabinet. Do not insert objects through the slots.
- Use only the type of power source indicated on the computer's label.
- Connect all equipment to properly grounded power outlets. Avoid using outlets on the same circuit as photocopiers or air control systems that regularly switch on and off.
- Do not let the computer's power cord become damaged or frayed.
- If you use an extension cord with the computer, make sure the total ampere rating of the devices plugged into the extension cord does not exceed the cord's ampere rating. Also, make sure the total of all devices plugged into the wall outlet does not exceed 15 amperes.
- Except as specifically explained in this User'S *Guide*, do not attempt to service the computer yourself.
- Unplug the computer and refer servicing to qualified service personnel under the following conditions:

If the power cord or plug is damaged; if liquid has entered the computer; if the computer has been dropped or the cabinet damaged; if the computer does not operate normally or exhibits a distinct change in performance. Adjust only those controls that are covered by the operating instructions.

- If you plan to use the computer in Germany, observe the following:  
To provide adequate short-circuit protection and over-current protection for this computer, the building installation must be protected by a 16 Amp circuit breaker.

Beim Anschluß des Computers an die Netzversorgung muß sichergestellt werden, daß die Gebäudeinstallation mit einem 16 A Überstromschutzschalter abgesichert ist.

# Importantes instructions de securite

Lire attentivement les instructions suivantes et les conserver pour les consulter en cas de besoin. Observer soigneusement tous les avertissements et directives marques sur l'ordinateur.

- Debrancher l'ordinateur avant de le nettoyer. N'utiliser chiffon chiffon humide. Veiller a ne pas renverser de liquides sur l'appareil.
- Ne pas placer l'ordinateur sur une surface instable ni pres d'une source de chaleur.
- Ne pas bloquer ni couvrir les orifices d'aeration de l'appareil. Ne pas introduire d'objets dans les ouvertures.
- Utiliser seulement le type de source d'alimentation electrique indique sur l'etiquette.
- Tout l'equipement doit être branché sur des prises de courant avec contact de terre. Ne jamais utiliser une prise sur le même circuit qu'un appareil a photocopies ou un systeme de controle de ventilation avec commutation marche-arrêt automatique.
- S'assurer que le cordon d'alimentation de l'ordinateur n'est pas abîmé ni effiloché.
- Dans le cas où on utilise un cordon de rallonge avec l'ordinateur, s'assurer que l'intensité en amperes requise pour tous les appareils branches sur ce cordon ne soit pas supérieure a la capacité du cordon. S'assurer aussi que cette intensité ne dépasse jamais la somme de 15 amperes pour l'ensemble des appareils.
- Sauf dans les cas spécifiques expliqués dans ce manuel de l'utilisateur, ne pas essayer d'entretenir ou de reparer l'ordinateur soi-même.
- Debrancher l'ordinateur et contacter un technicien qualifié dans les circonstances suivantes:

Si le cordon ou la prise sont abîmés; si un liquide a pénétré à l'intérieur de l'appareil; si on a laissé tomber l'appareil ou si le boîtier est endommagé; si l'ordinateur ne fonctionne pas normalement ou fonctionne d'une manière très différente de l'ordinaire. N'ajuster que les commandes décrites dans les directives.

- Pour utiliser l'ordinateur en Allemagne, il est nécessaire que le bâtiment soit muni d'un disjoncteur de 16 amperes pour protéger l'ordinateur contre les courts-circuits et le survolage.

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# Contents

## *Introduction*

---

VGA Drivers . . . . .	2
Optional Equipment . . . . .	3
Memory . . . . .	3
Video Memory . . . . .	3
Microprocessor . . . . .	3
Drives . . . . .	3
Math Coprocessor . . . . .	4
How to Use This Manual . . . . .	4
Where to Get Help . . . . .	5
CompuServe On-line Support . . . . .	6

## *Chapter 1   Setting Up Your System*

---

Unpacking Your Computer . . . . .	1-1
Setting the Voltage Selector Switch . . . . .	1-2
Connecting Computer Components . . . . .	1-3
Connecting a Keyboard and Mouse . . . . .	1-4
Connecting a Monitor . . . . .	1-5
Connecting a Printer or Other Device . . . . .	1-6
Connecting the Power Cord . . . . .	1-7
Turning On the Computer . . . . .	1-7
Turning Off the Computer . . . . .	1-9
Running the SETUP Program . . . . .	1-10
Starting the SETUP Program . . . . .	1-10
Displaying System Information . . . . .	1-12
Setting the Date and Time . . . . .	1-12
Setting the Diskette Drive(s) . . . . .	1-12
Setting the Hard Disk Drive(s) . . . . .	1-13
Checking System Memory . . . . .	1-14
Setting the Video Display Type . . . . .	1-14
Setting Keyboard Options . . . . .	1-15
Setting the Processor Speed . . . . .	1-15
Cyrix Cache Option . . . . .	1-16
Setting Chip Set Feature Control Options . . . . .	1-16

Exiting SETUP . . . . .	1-17
Post-SETUP Procedures . . . . .	1-17

## **Chapter 2    *Using Your Computer***

---

Working Comfortably	2-1
Inserting and Removing Disks	2-2
Stopping a Command or Program	2-3
Resetting the Computer	2-4
Changing the Processor Speed	2-5

## **Chapter 3    *Installing and Removing Options***

---

Removing the Cover	3-2
Replacing the Cover	3-4
Locating the Internal Components	3-5
Changing the Jumper Settings	3-7
Setting the Jumpers	3-8
Installing Memory Modules (SIMMs)	3-10
Inserting SIMMs	3-11
Removing SIMMs	3-13
Installing an Option Card	3-15
Removing an Option Card	3-18
Adding Video Memory	3-18
Installing the Video Chips	3-18
Installing the Math Coprocessor	3-20
Post-installation Procedures	3-22

## **Chapter 4    *Installing and Removing Drives***

---

Setting the IDE Hard Disk Drive Jumpers	4-2
Removing Mounting Frames	4-3
Installing a Drive in the Front Internal Drive Bay	4-4
Removing a Drive From the Front Internal Drive Bay	4-8
Installing a Drive in an External Drive Bay	4-9
Removing a Drive From an External Drive Bay	4-12
Installing a Drive in the Rear Internal Drive Bay	4-14
Removing a Drive From the Rear Internal Drive Bay	4-17
Post-installation Procedures	4-19

## **Chapter 5    *Troubleshooting***

---

Identifying Your System	5-1
The Computer Will Not Start	5-3
The Computer Does Not Respond	5-4
Keyboard Problems	5-4
Mouse Problems	5-5
Monitor Problems	5-5
Diskette Problems	5-6
Diskette Drive Problems	5-7
Hard Disk Drive Problems	5-8
Software Problems	5-9
Printer Problems	5-10
Option Card Problems	5-11
Memory Module Problems	5-11
Controller Problems	5-12
Internal Battery Problems	5-12

## **Appendix A    *Specifications***

---

CPU and Memory . . . . .	A - 1
Controllers . . . . .	A - 2
Interfaces . . . . .	A - 2
Mass Storage . . . . .	A - 3
Keyboard . . . . .	A - 4
SETUP Program . . . . .	A - 4
Physical Characteristics . . . . .	A - 4
Power Supply . . . . .	A - 5
Environmental Requirements . . . . .	A - 5
Tested Operating Environments . . . . .	A - 6
Video Memory and Supported Resolutions . . . . .	A - 7
Options Available from EPSON . . . . .	A - 7
Hard Disk Drive Types . . . . .	A - 8
Drive Option Information . . . . .	A - 10
DMA Assignments . . . . .	A - 11
Hardware Interrupts . . . . .	A - 12
System Memory Map . . . . .	A - 13
System I/O Address Map . . . . .	A - 14
Connector Pin Assignments . . . . .	A - 16

***Glossary***

---

***Index***

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***EPSON U.S. and International Marketing Locations***

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# ***Introduction***

Your new EPSON® computer provides the following features:

- ☐ Cyrix®486SLC-33 or 486SLC2-50 microprocessor
- ☐ 2MB, 4MB, or 8MB of internal memory, expandable to 16MB
- ☐ System and video BIOS shadow RAM
- ☐ At least 512KB of on-board video memory; 512KB is expandable to 1024KB (1MB)
- ☐ Built-in, local bus SVGA port
- ☐ Two built-in serial ports and one built-in parallel port
- ☐ One built-in PS/2™ compatible keyboard port and one built-in PS/ 2 compatible mouse port
- ☐ 1KB of internal cache
- ☐ Support for relocation of 128KB of memory
- ☐ High-speed local bus video controller with True Color™ support, providing resolutions up to 1280 x 1024 in 16 colors
- ☐ Socket for an optional math coprocessor
- ☐ Five full-length, 16-bit, ISA-compatible option slots
- ☐ Space for up to seven mass storage devices (four externally accessible and three internal)
- ☐ Support for up to two IDE hard disk drives and two diskette drives (or one diskette drive and one tape drive)
- ☐ Real-time clock and calendar on main system board with built-in rechargeable battery backup.



The 486SLC microprocessor in this computer is *i486SX* instruction set compatible. It features a 32-bit internal/ 16-bit external data path.

The shadow RAM feature speeds up processing by moving the system and video BIOS into the RAM area of memory.

Using the built-in interfaces, you can connect most of your peripheral devices directly to the computer so you do not have to install option cards. You can use the option slots to enhance your system with extra functions such as a modem card, a network controller card, or additional interface ports.

The local bus video interface provides data transfer at the full speed of the processor, rather than at the standard 8.33 MHz ISA bus speed.

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## **VGA Drivers**

Your computer comes with VGA drivers and utilities for use with the integrated video interface. With these drivers, you can take advantage of the extended VGA features such as high resolutions and 132-column text mode when you run popular applications. If your system was configured for you, these drivers and utilities may be installed on your hard disk. If you need to install them yourself, see the README files on your Drivers diskettes or your hard drive, as described in Chapter 1. To obtain drivers for additional applications, call the EPSON Connection<sup>SM</sup> or access the Epson America Forum on CompuServe@.

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## ***Optional Equipment***

You can easily upgrade your computer by installing additional memory and a wide variety of options, as described in Chapters 3 and 4.

### ***Memory***

By adding 1MB or 4MB SIMMs (single inline memory modules) to the main system board, you can expand the computer's memory up to 16MB.

### ***Video Memory***

Your system came with at least 512KB of video memory. If your system came with 512KB, you can increase it to 1024KB (1MB), which allows you to use higher resolutions with more colors.

### ***Microprocessor***

Your system supports one of the following microprocessors:

☐ 486SLC-33

☐ 486SLC2-50.

### ***Drives***

Your system can hold up to seven mass storage devices, including hard disk drives, diskette drives, tape drive(s), a CD-ROM drive, or optical drive(s). As your storage needs expand, you can install additional drives.

## **Math Coprocessor**

You may want to install an optional math coprocessor, which allows your computer to perform mathematical calculations and process graphics more quickly.

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## **How to Use This Manual**

This manual contains the information you need to get the best results from your computer. You do not have to read everything; check the following chapter summaries.

**Chapter 1** provides simple instructions for setting up your system, turning it on and off, and connecting peripheral devices such as the monitor and printer. It also describes running the SETUP program to define your computer's configuration.

**Chapter 2** covers general operating procedures, such as using diskettes, resetting the computer, and changing the processor speed.

**Chapter 3** describes how to remove and replace the computer's cover, change jumper settings, and install optional equipment such as option cards and memory modules.

**Chapter 4** explains how to install and remove disk drives

**Chapter 5** contains troubleshooting tips.

**Appendix A** lists the specifications of your computer.

At the end of this manual you'll find a **Glossary**, an **Index**, and a list of international marketing locations.

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## ***Where to Get Help***

If you purchased your computer in the United States or Canada, EPSON provides customer support and service through a network of Authorized EPSON Customer Care Centers. EPSON also provides support services through the EPSON Connection. In the United States, dial (800) **922-8911**. In Canada, dial (800) **GO-EPSON**.

Call the EPSON Connection for the following:

- ☐ Technical assistance with the installation, configuration, and operation of EPSON products
- ☐ Assistance in locating your nearest Authorized EPSON Reseller or Service Center
- ☐ Customer Relations
- ☐ EPSON technical information library fax service
- ☐ Product literature on current and new products.

You can purchase accessories, manuals, or parts for EPSON products from EPSON Accessories at (800) 873-7766 (U.S. sales only). In Canada, call (800) **GO-EPSON** for sales locations.

When you call for technical assistance, be ready to identify your system and its configuration, and provide any error messages to the support staff. See Chapter 5 for more information.

If you purchased your computer outside the United States or Canada, contact your EPSON dealer or the marketing location nearest you for customer support and service. International marketing locations are listed at the end of this manual.

If you need help with any software application program you are using, see the documentation that came with that program for technical support information.

## ***CompuServe On-line Support***

The fastest way to access helpful tips, specifications, drivers, application notes, tables for DIP switch or jumper settings, and bulletins for EPSON products is through the Epson America Forum on CompuServe.

If you are not currently a member of CompuServe, you are eligible for a free introductory membership as an owner of an EPSON product. This membership entitles you to:

- ☐ An introductory \$15 credit on CompuServe
- ☐ Your own user ID and password
- ☐ A complimentary subscription to *CompuServe Magazine*, CompuServe's monthly publication.

To take advantage of this offer, call (800) 848-8199 in the United States and Canada and ask for representative #529. In other countries, call the following U.S. telephone number: **(614) 529-1611** or your local CompuServe access number.

If you are already a CompuServe member, simply type **GO EPSON** at the menu prompt to reach the Epson America Forum.

## Chapter 1

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# Setting Up Your System

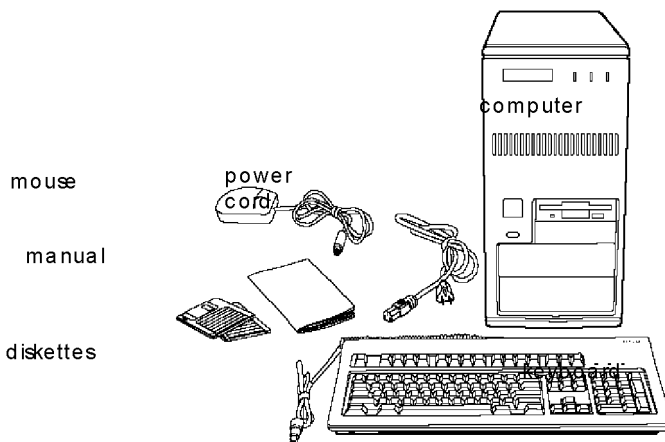
This chapter briefly describes how to set up your computer. It includes the following information:

- ☐ Unpacking your computer
- ☐ Setting the voltage selector switch
- ☐ Connecting the computer components
- ☐ Turning the computer on and off
- ☐ Running the SETUP program
- ☐ Post-SETUP procedures.

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## Unpacking Your Computer

When you unpack your system components, make sure you have these items:



If you purchased any optional equipment that goes inside the computer—such as option cards, memory modules, a hard disk drive, or a diskette drive—you should install these devices before you connect your computer. See Chapters 3 and 4 for instructions.

---

## ***Setting the Voltage Selector Switch***

Your system is powered by a 200 Watt power supply. The power supply voltage is controlled by a voltage selector switch on the computer's back panel. You can set this switch to 110 VAC or 220 VAC.

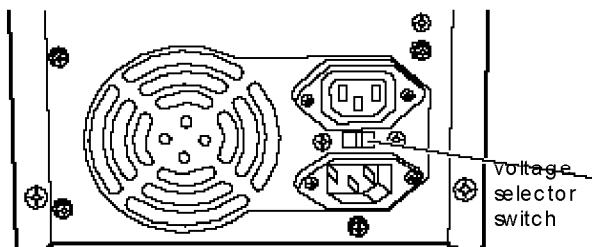
EPSON ships the computer with the voltage selector switch set to 110 VAC. This setting is appropriate for line source voltages between 100 and 120 VAC, and is generally the appropriate setting to select if you plan to use your computer in North America, Mexico, or Japan.

If you plan to operate the computer in the United Kingdom, Europe, or South American countries, you will probably need to reset the voltage selector switch to 220 VAC. Doing so allows your computer to handle line source voltages between 200 and 240 VAC.

### **Caution**

Before you turn on the power to your system, make sure the voltage selector is set to the appropriate setting for the electrical power source in your location or you will seriously damage your system.

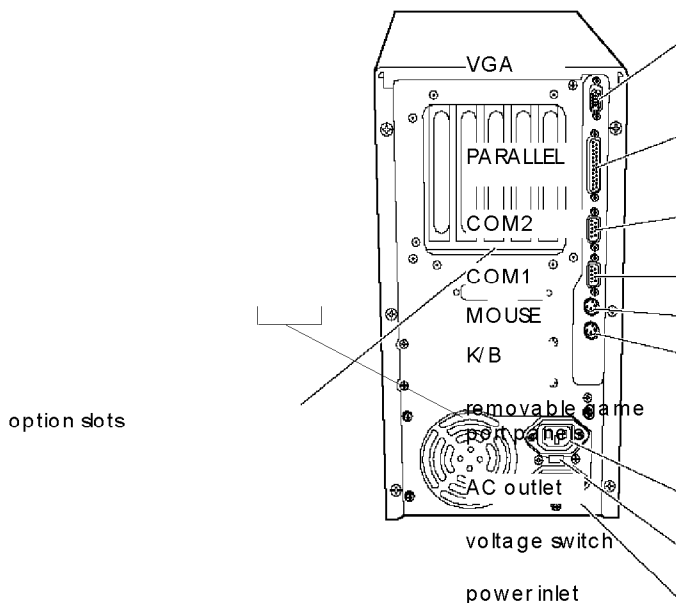
To change the voltage selector switch setting, slide the switch to the right to select 220 VAC, or to the left to select 110 VAC, as shown below.



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## ***Connecting Computer Components***

Use the illustration below to locate the ports on the back of your system as you connect the keyboard, monitor, printer, and other devices.





Your system may also include two removable game port panels below the option slots. You can remove one or both of these if you want to install one or two connectors to the optional port interface on the system board.

## ***Connecting a Keyboard and Mouse***

To connect a keyboard, hold the cable connector so the arrow on the connector faces up. Insert it into the port marked K/B.

If you have a PS/ 2 compatible mouse, insert the connector into the port marked MOUSE

### **Caution**

Although the connectors and ports for the mouse and keyboard are physically identical, they cannot be used interchangeably. Be sure to plug the mouse connector into the MOUBE port, or you may damage your system.

You must install a mouse driver if your system has not been preconfigured. See your mouse manual for instructions. (If you are using Windows, the installation program automatically loads a mouse driver for Windows applications.)

## **Connecting a Monitor**

If you have a VGA or SVGA monitor (or a multifrequency monitor with an analog connector), follow these steps to connect it to the computer's built-in VGA port:

1. There should be two cables provided with your monitor: the monitor cable (to connect it to the computer) and the power cable (to connect it to the power source). On some monitors, the monitor cable is permanently attached. If your monitor does not have an attached cable, connect the cable to it now.
2. Insert the monitor connector into the VGAport on the computer.
3. If the connector has retaining screws, tighten them.
4. Plug the monitor's power cable into the power inlet on the back of the monitor. Plug the other end of the power cable into a grounded electrical outlet or into the power outlet on the back of the computer.

### **Caution**

Before you plug the monitor's power cable into the back of your computer, make sure the monitor's power requirements do not exceed 1 Amp for 115 VAC and 0.5 Amp for 230 VAC.

## ***Connecting a Printer or Other Device***

Your computer has one bi-directional parallel and two serial ports. To connect a printer or other peripheral device, follow the appropriate instructions below.

### ***Using the parallel port***

Follow these steps to connect a parallel printer to your computer:

1. Plug the connector end of the printer cable into the computer's PARALLEL port. If the connector has retaining screws, tighten them.
2. Connect the other end of the cable to the printer. To secure the cable, squeeze the clips at each side of the printer port and push them into place.
3. Plug the printer's power cord into a grounded electrical outlet.

### ***Using the serial ports***

If you have a printer, modem, or other device with a serial interface, you can connect it to one of the serial (RS-232C) ports on the back of the computer. Make sure you have a cable compatible with a DB-9P connector.

To connect a serial device, insert the connector into one of the ports marked **COM1** and COM2. If you are connecting only one serial device, use the **COM1** port.

If you want to assign **COM1** as COM3 or COM2 as COM4, see Chapter 3 for information on jumper settings.

## ***Connecting the Power Cord***

Follow these steps to connect the power cord:

1. Plug the power cord into the power inlet on the back panel of the computer.

### **WARNING**

To avoid an electric shock, be sure to plug the cord into the computer before plugging it into the wall outlet.

2. Plug the other end of the power cord into an appropriate grounded electrical outlet.

---

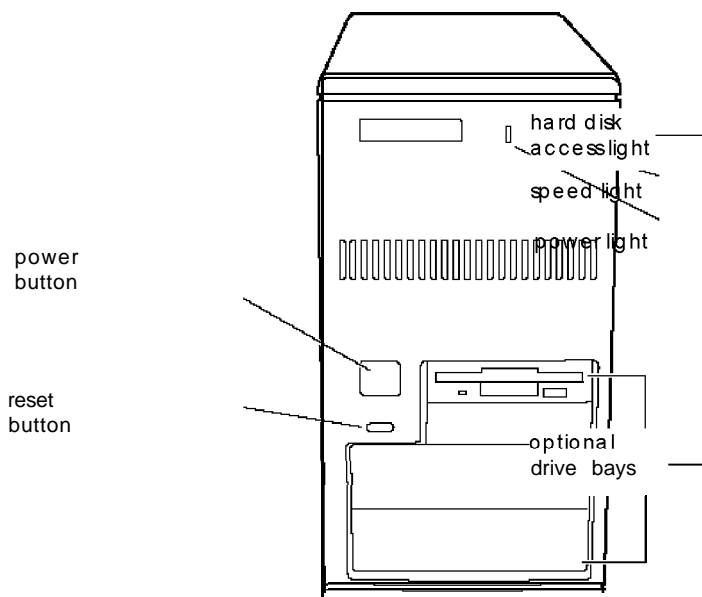
## ***Turning On the Computer***

Before you turn on your computer, be sure to read the Important Safety Instructions at the beginning of this manual.

Follow these steps to turn on your system :

1. If there is a protective card in the diskette drive, remove it now.
2. Turn on the monitor, printer, and any other peripheral devices connected to the computer.
3. If you do not have a hard disk with an operating system loaded on it, insert your main operating system diskette in drive A.

4. Press the power button located on the left side of the front panel, as shown below.



The power indicator lights up. After a few seconds, the computer displays a count of its system memory, and then performs its power-on diagnostics. This is a series of checks the computer runs each time you turn it on to make sure everything is working correctly.

If necessary, use the controls on your monitor to adjust the brightness and contrast until you can easily see the characters on the screen.

5. When the system has successfully completed its diagnostics, MS-DOS® prompts you to verify the correct date and time. If they are correct, press **Enter**. Otherwise, enter the current date and time.

If your system is configured to automatically start Microsoft® Windows™ or a word processing program, or has a different operating system, you will see the first menu or screen of that program displayed at this point. If your system is not configured to start like this, you will see the MS-DOS operating prompt, such as `C: \>` or `A: \>`, each time you turn on the computer.

Follow the instructions in the “Running the SETUP Program” section to configure your system using the SETUP program.

---

## ***Turning Off the Computer***

Whenever you turn off your system, follow these steps:

1. Save your data and exit any application program you are using.
2. Check the hard disk drive light and the diskette drive light(s) to make sure they are not on. Do not turn off the computer if a drive light is on, because you can damage the drive or lose data.
3. Remove any diskette(s) from the diskette drive(s).
4. Press the power button to turn off the computer and then turn off the monitor, printer, and any other peripheral devices.

---

## ***Running the SETUP Program***

Be sure to run SETUP the first time you use your computer so you can make sure it is configured correctly. (You also may need to run SETUP again if you change your configuration.) SETUP lets you verify or change the following:

- ☐ Current date and time
- ☐ Type of diskette drive(s) and hard disk drive(s)
- ☐ System memory
- ☐ Video display type
- ☐ Keyboard options
- ☐ Processor speed
- ☐ Internal cache function
- ☐ Shadow options
- ☐ Processor chip features

SETUP is stored in the computer's ROM BIOS, so you can run it any time. The configuration information resides in an area of memory called CMOS RAM. A battery backs up this memory so it is not erased when you turn off or reset the computer.

## ***Starting the SETUP Program***

You can run SETUP whenever you turn on or reset your computer. After performing power-on diagnostics, your computer displays the following prompt:

Press F2 to run the setup utility

To start **SETUP**, press **F2**.

If the system detects an error in its configuration when you turn it on, you will see the following message:

Press the **F1** key to continue, **F2** to run the  
setup utility

If you see this message, press **F2** to run **SETUP** to correct your configuration.

The table below lists the keys you can use to perform **SETUP** operations.

***SETUP function keys***

<b>Key</b>	<b>Function</b>
↑↓←→	Moves the cursor to the next or previous modifiable option
+ -	Change the values in the field
PgDn PgUp	Displays the next or the previous menu
F1	Displays a help screen describing the option currently selected
F2	Displays the system information screen
F4	From the exit menu, saves the changes you have made and restarts your computer
F5	From the exit menu, restores the factory default values for all <b>SETUP</b> options
F6	From the exit menu, leaves the <b>SETUP</b> program without saving any changes
Esc	Displays the exit menu

Whenever you are in **SETUP**, the bottom of the screen lists the keys you can press to perform specific functions.



## ***Displaying System Information***

SETUP provides a system information screen which lists the following:

- ☐ Processor type
- ☐ Coprocessor type (if one is installed)
- ☐ Reserved memory
- ☐ BIOS version number
- ☐ Addresses for video mode, serial ports, and printer ports.

To see this information, press F2 from either of the SETUP screens. Press any key to return to the SETUP screen.

## ***Setting the Date and Time***

The real-time clock in your computer continuously tracks the date and time—even when the computer is turned off. Once you set the date and time using SETUP, you should not need to change them, unless you adjust the time for daylight savings or a different time zone. (The computer automatically changes the date for leap years.)

Use: ↑, ↓, ←, or → to move the cursor to the value you want to change. Then press + or - until you see the value you want.

## ***Setting the Diskette Drive(s)***

On your system, diskette drive A is the 3.5-inch, high-density drive installed in the lower drive bay on your system. You may also have another drive of a different size or capacity; this is drive B. Check the settings for both drives and correct them if necessary.

## ***Setting the Hard Disk Drive(s)***

Your system comes with a hard disk auto-sensing feature that automatically detects the type of hard disk drive(s) installed in your computer. (See Appendix A for a list of hard disk drive types and their parameters.) The SETUP program allows you to view or change the parameters for your hard disk drive.

If you are using an older drive or a preformatted drive, it may not support the auto-sensing feature. If the SETUP program displays drive parameters that do not match your drive, you need to select a different drive type or define your own drive type or reformat the disk. See “Defining your own drive type” below for instructions.

### ***Using the auto-sensing feature***

To allow the computer to automatically detect your hard disk drive, follow these steps:

1. Move the cursor to **Hard Disk 1** or **2** and press **+** or **-** until you see **AUTO DETECT 1** or **AUTO DETECT 2**. Select **AUTO DETECT 1** for your first hard disk drive and **AUTO DETECT 2** for your second hard disk drive.
2. Press **ESC** to return to the SETUP menu and press **F4** to save your settings. The computer restarts and automatically detects the hard disk drive. The next time you run SETUP, you'll see the parameters detected by the auto-sensing feature.

## ***Defining your own drive type***

If the parameters for your hard disk do not match the parameters detected by the auto-sensing feature, or if you want to use your drive with parameters other than the defaults, follow these steps to define your own type:

1. Move the cursor to Hard Disk 1 or 2 and press + or - until you see User Def 1 or User Def 2.
2. Press → to move the cursor to the Cyl field.
3. Type the appropriate cylinder value for your hard disk. The documentation that came with your hard disk drive will provide the parameter information you need.
4. Continue pressing → to move the cursor to the next field and type in the appropriate values.

## ***Checking System Memory***

When you boot your system, the system BIOS detects the type of RAM and updates the base memory size and the extended memory size automatically. You see the memory configuration displayed on this SETUP screen.

## ***Setting the Video Display Type***

The Video Card option lets you define the type of adapter you are using for your primary display. If you connected your monitor to the computer's built-in VGA port, select VGA/EGA. If you installed an optional video card, follow the guidelines below to select the correct adapter type.

### *Video display type options*

Select	If
EGA/VGA	You connected your monitor to the built-in VGA port or you installed a VGA enhanced graphics adapter (EGA) card
CGA40*	You installed an optional color graphics adapter set to 40-column color graphics adapter (CGA) mode
CGA80*	You installed a CGA or a multi-mode graphics adapter (MGA) attached to a color monitor
MONO*	You installed a monochrome display adapter or an MGA attached to a monochrome monitor

\* For these options, you must change jumpers J1 and J2 on the system board to the OFF position. See Chapter 3 for information on setting jumpers

## **Setting Keyboard Options**

Two options in SETUP allow you to control keyboard settings. The Keyboard option allows you to disable the built-in keyboard connector.

The NumLock on at boot option determines the initial state of the Num Lock function when you turn on or reset your system. When Num Lock is off, the keypad controls cursor movement. If Num Lock is on, the keypad types numbers.

Select YES to set the Num Lock function on when the system starts or NO to leave it off.

## **Setting the Processor Speed**

The CPU Speed option sets the processor speed to fast or slow. At fast speed, your processor operates at its highest speed. At the slow speed setting, the processor operates at 8 MHz to provide compatibility with older application programs. Leave the speed set to fast unless you know that your application program requires the slow setting.

## ***Cyrix Cache Option***

The 486SLC-33 or 486SLC2-50 microprocessor includes a 1KB internal cache. Leave this option set to Enabled.

## ***Setting Chip Set Feature Control Options***

The second screen of SETUP contains options which control certain chip functions on your system board. Press **PgUp** or **PgDn** to display this screen

### ***Relocating memory***

The Relocate Memory option relocates the memory between A0000h to BFFFFh and D0000h to EFFFFh for use as extended memory. If you enable shadowing between D0000h and EFFFFh, however, relocation is automatically disabled.

### ***Shadow RAM options***

Your computer can access RAM (random access memory) faster than ROM (read only memory).

The Shadow BIOS ROM (always enabled) and Shadow Video ROM options allow your system to copy the contents of its system and/ or video ROM into RAM so it can perform certain operations faster.

You can also shadow 32KB or 64KB of memory that starts at the indicated addresses to RAM. If you enable these options, you cannot use the Relocate Memory feature between 640KB and 1024KB.

### ***Additional options***

Two additional chip set feature options allow you to slow down your system in case you need compatibility with slower option cards or diskette drives.

If you enable the ISA 1 wait state option, the system inserts one wait state in a 16-bit ISA cycle rather than providing the fastest processing at zero wait states.

The Slow Refresh option, when enabled, improves system performance because it shortens the time needed for each refresh cycle.

## ***Exiting SETUP***

When you leave SETUP, you can save your settings and reboot your system, or exit SETUP without saving your settings. You can also return all values to the factory defaults.

To leave SETUP, press **ESC** from any SETUP screen. From the Exiting SETUP menu, you can press these keys:

- |            |  |
|------------|--|
| <b>Esc</b> | Returns to SETUP   |
| <b>F4</b>  | Saves the changes you have made to your configuration and restarts your computer |
| <b>F5</b>  | Supplies the factory default values for all options                              |
| <b>F6</b>  | Exits SETUP and returns to the system prompt without saving any changes.         |

---

## ***Post-SETUP Procedures***

After you run SETUP for the first time, you may need to install the operating system on your computer if your system is not preconfigured. Make sure your hard disk drive is partitioned and formatted for the operating system you plan to install. See your operating system manual for instructions.

Once you have installed your operating system, install any software you plan to use. See your application program manuals for instructions.

You may also want to install the optional extended video drivers and utilities. (If your computer was configured for you, these drivers are already installed.) For more information on installing video drivers and utilities, use a text editor to open the README files included on your Drivers diskettes. Make sure Windows is installed before you install video drivers for Windows applications.

To read the README files, insert the Drivers diskette, type the following, and press **Enter**:

```
A : \README
```

To print the files to a laser printer, enter the following:

```
A : \README.P
```

To obtain drivers for additional applications, call the EPSON Connection or access the Epson America Forum on CompuServe.

## *Chapter2*

---

### ***Using Your Computer***

This chapter briefly describes the following operations:

- ☐ Working comfortably
- ☐ Inserting and removing diskettes
- ☐ Stopping a command or program
- ☐ Resetting the computer
- ☐ Changing the processor speed

---

#### ***Working Comfortably***

This section provides some tips for creating a comfortable work environment.

- ☐ Use good posture. Keep your elbows, hips, and knees bent at approximately 90 degree angles and keep your wrists as close to horizontal as possible.
- ☐ Vary your posture often and take frequent breaks. Stand up, stretch, and move around.
- ☐ Use a good chair. Make sure your chair supports your lower back. A chair with padded armrests lets you rest your arms as you work.
- ☐ Keep your copy stand at the same eye level as your screen. This reduces eye and neck strain. Also, rest your eyes occasionally by closing them or focusing on a fixed spot in the distance.

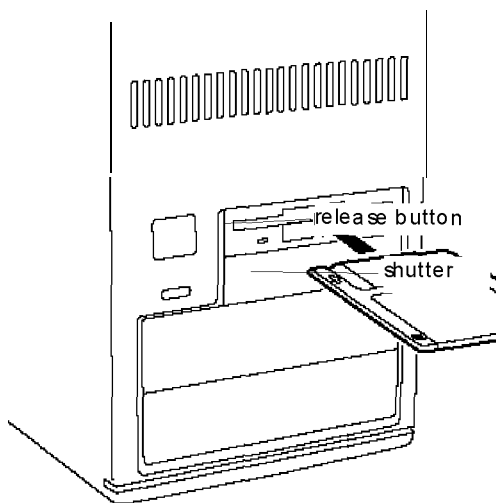


- ❑ Be gentle with your keyboard. Too much force creates tension in your hands. Also, make sure your work surface has enough room for you to move the mouse or other pointing device freely.
- ❑ Use good lighting that isn't too bright. Try to keep bright light sources out of your field of vision when you are looking at the screen.
- ❑ Place your monitor directly in front of you and sit about an arm's length away from it. The top of the screen should be slightly below your eye level so you look down at the screen. Position the monitor so that no light is reflected from the screen.

---

## ***Inserting and Removing Disks***

To insert a diskette into a 3.5-inch drive, hold the diskette with the label facing up and the shutter leading into the drive, as shown in the following illustration. Slide the diskette into the drive until it clicks into place.



**Note**

The 3.5-inch drive in the lower bay of your computer is drive A. If you install another drive in the upper bay, it is drive B. You can change the drive assignments through your SETUP program.

To insert a diskette into a 5.25-inch drive, hold the diskette with the label facing up and the read/write slot leading into the drive. Slide the diskette into the drive and then turn down the latch to secure it.

When you want to remove the diskette, make sure the drive light is off; then press the release button or turn the latch. Remove the diskette and store it properly.

**Caution**

Never remove a diskette or reset or turn off the computer while a diskette drive light is on. You could lose data. Also, remove all diskettes before you turn off the computer.

---

## ***Stopping a Command or Program***

You may sometimes need to stop a command or program while it is running. If you have entered an MS-DOS or application program command that you want to stop, try one of the following:

- ☐ Press **Pause**
- ☐ Hold down **Ctrl** and press **C**
- ☐ Hold down **Ctrl** and press **Break**.

If these methods do not work, you may need to reset the computer as described below. Do not turn off the computer to exit a program or stop a command unless you have to, because the computer erases any data you did not save.

---

## ***Resetting the Computer***

Occasionally, you may want to clear the computer's memory without turning it off. You can do this by resetting the computer.

For example, if an error occurs and the computer does not respond to your keyboard entries, you can reset it to reload your operating system and try again. However, resetting erases any data in memory that you have not saved, so reset only if necessary.

### **Caution**

Do not reset the computer to exit a program. Some programs classify and store new data when you exit them normally. If you reset the computer without properly exiting a program, you may lose data.

To reset the computer, the operating system must be either on the hard disk or on a diskette in drive A, so if you do not have a hard disk, insert the system diskette in drive A. If you are using MS-DOS, you can hold down **Ctrl** and **Alt** and press **Del**. The screen displays nothing for a moment and then the computer reloads your operating system.

You can also press the RESET button located on the front side of your computer to reset it.

If resetting the computer does not correct the problem, you probably need to turn it off and on again. Remove any diskette(s) from the diskette drive(s). Turn off the computer and wait 20 seconds. If you do not have a hard disk, insert the system diskette in drive A. Then turn on the computer.

---

## ***Changing the Processor Speed***

Your computer's processor can operate at two speeds: fast or slow (8 MHz). The slow speed is available to provide compatibility with older application programs.

When your computer is operating at fast speed, the SPEED light on the front panel is on. When the computer is operating at slow speed, the light is off.

You should use fast speed for almost everything you do because your programs will work faster. However, certain application programs have specific timing requirements and can run only at the slower speed. See your application software manual to determine if this is the case. Some copy-protected programs require the computer to run at slow speed while accessing the program on a diskette. These programs also usually require you to leave a key disk-the diskette that contains the copy protection-in the diskette drive.

You can change the processor speed temporarily by entering one of the following commands from the numeric keypad on your keyboard :

- ☐ To select slow speed, press **Ctrl Alt -**. (Hold down the **Ctrl** key and the **Alt** key simultaneously and then press the - key on the numeric keypad.)
- ☐ To select fast speed, hold down the **Ctrl** and **Alt** keys and press + on the numeric keypad.

**Note**

You can use the commands listed above while you are running a program. However, if the program uses one of these commands for another function, you cannot use it to change the processor speed. You can, however, change the processor speed through SETUP.

The speed setting remains in effect until you reset or turn off your computer.

## Chapter3

---

# ***Installing and Removing Options***

You can enhance the performance of your computer by adding optional equipment such as system or video memory modules, or option cards.

This chapter first describes how to remove your computer's cover to install options and how to replace the cover when you are finished. It then describes the following:

- ☐ Locating the internal components
- ☐ Changing the jumper settings
- ☐ Installing and removing SIMMs (single in line memory modules)
- ☐ Installing and removing option cards
- ☐ Adding video memory
- ☐ Installing a math coprocessor.

### **Caution**

Never install options or change jumper settings when the computer is turned on or the power cable is connected to the computer.

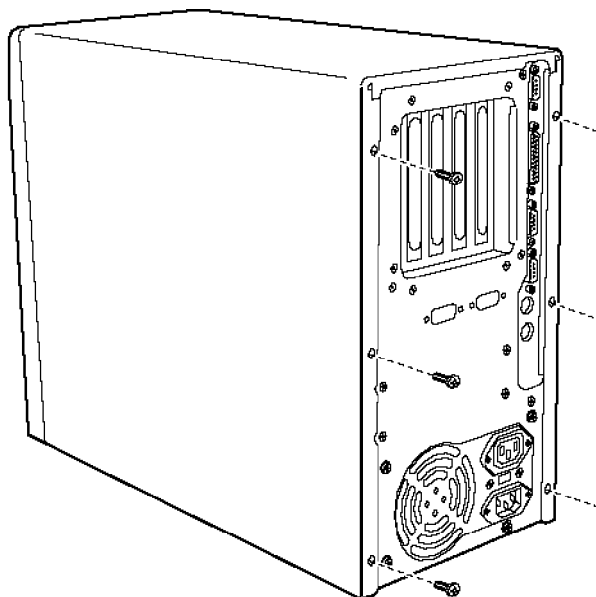
Once you have installed your options, see "Post-installation Procedures" on page 3-22.

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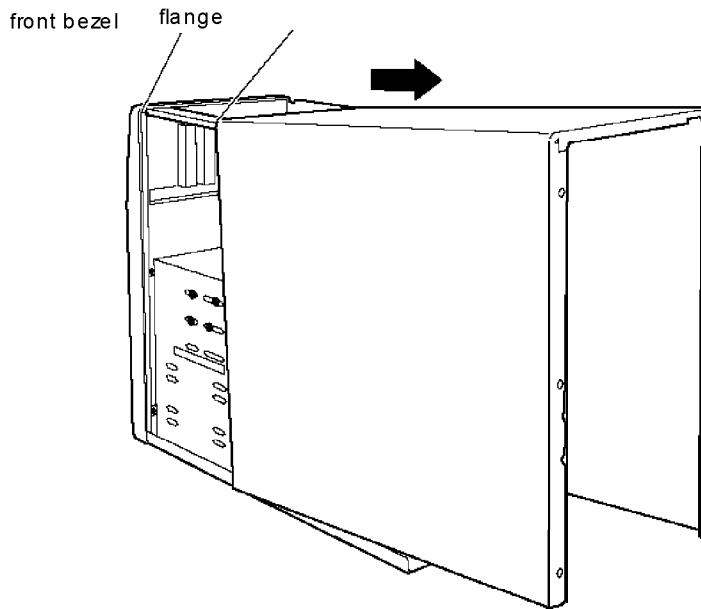
## ***Removing the Cover***

You need to remove the computer's cover to install any of the options described in this chapter or to install or remove a disk drive (as described in Chapter 4). Follow these steps:

1. Turn off the computer and then any peripheral devices (including the monitor and printer).
2. Disconnect the computer's power cable from the electrical outlet and from the back panel. Also disconnect any other cables that are connected to the computer, including the keyboard cable.
3. Turn the computer around so the back panel is facing you.
4. Remove the six screws securing the back panel.



5. Grasp the sides of the cover and pull it straight back, until it clears the computer.



6. Set the cover aside.
7. Ground yourself to the computer by touching the metal surface of the back panel.

**WARNING**

Be sure to ground yourself by touching the back panel of the computer every time you remove the cover. If you are not properly grounded, you could generate an electric shock that could damage a component when you touch it.



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## ***Replacing the Cover***

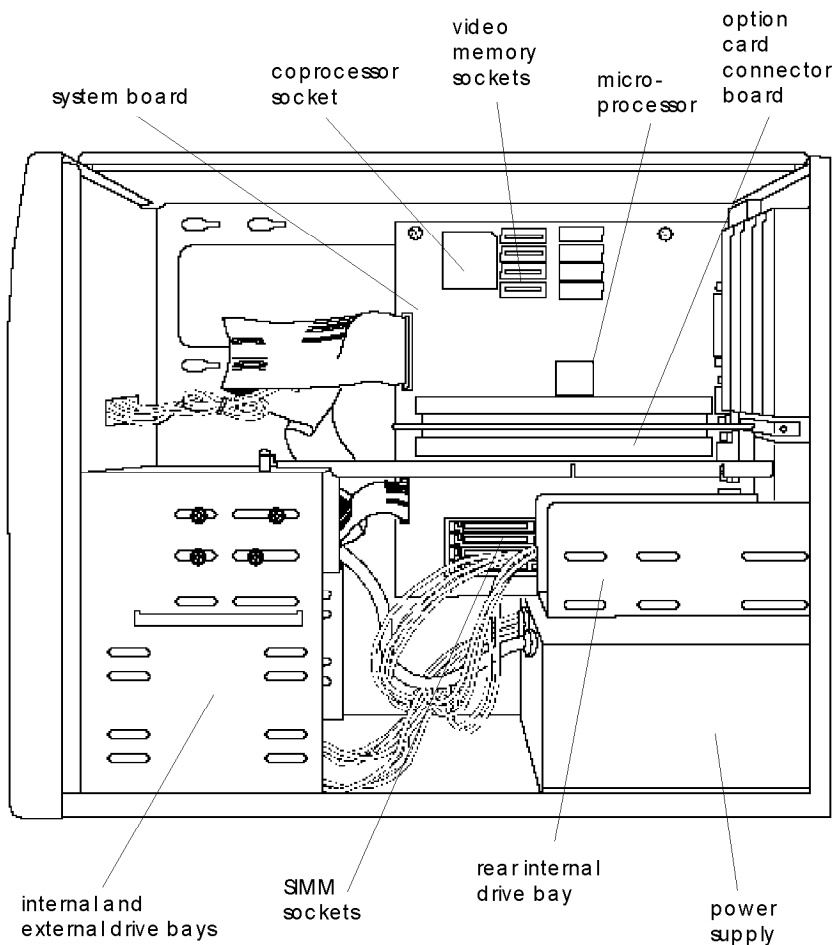
When you are ready to replace the computer's cover, follow these steps:

1. Make sure all the internal components are installed properly.
2. Check all ribbon cable connections, especially those that might have been loosened during your work.
3. Make sure all ribbon cables are out of the way so they do not catch on the cover.
4. Slide the cover forward until the flange at the front of the cover slides between the front bezel and the chassis of the computer. (See the illustration on page 3-3.)
5. Replace the six cover retaining screws.
6. Reconnect the computer to the monitor, printer, keyboard, and any other peripheral devices you have. Then reconnect the power cable to the back of the computer and to an electrical outlet.

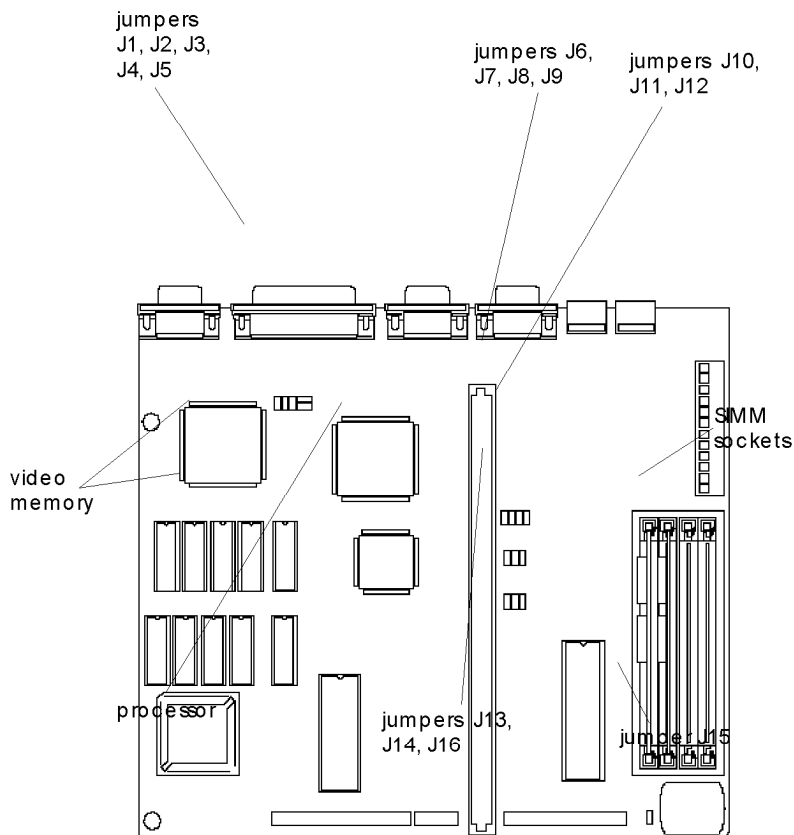
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## ***Locating the Internal Components***

As you follow the instructions in this chapter, refer to the illustration below to locate the major components inside your computer.



The illustration below shows the main system board inside your computer. Use this illustration to locate jumpers, SIMM sockets, video memory chip sockets, and the CPU socket.



---

## Changing the Jumper Settings

The jumpers on the main system board control certain functions and are preset to factory default positions. (See the illustration above to locate the jumpers.)

Use the information in the following tables to change jumper settings, if necessary.

### Note

Any jumpers not listed in the following tables are for service purposes only. Do not change their settings.

### Miscellaneous jumper settings

Jumper number	Jumper setting	Function
J3	1-2 OFF*	Enables VGA IRQ Disables VGA IRQ
J6	1-2* 2-3	Enables COM 1 Disables COM 1
J7	1-2* 2-3	Assigns COM 1 serial port as COM1 (3F8H-3FFH)** Assigns COM 1 serial port as COM 3 (3E8H-3EFH)**
J8	1-2* 2-3	Enables COM 2 Disables COM 2
J9	1-2* 2-3	Assigns COM 2 serial port as COM 2 (2F8H-2FFH)** Assigns COM 2 serial port as COM 4 (2E8H-2EFH)**
J10	1-2* 2-3	Enables parallel port Disables parallel port
J11	1-2* 2-3	Assigns parallel port as LPT1 (378H-37FH)** Assigns parallel port as LPT2 (278H-27FH)**
J12	1-2* 2-3	Enables optional game port Disables optional game port
J13	1-2* 2-3	Enables diskette drive controller Disables diskette drive controller

### *Miscellaneous jumper settings (continued)*

Jumper number	Jumper setting	Function
J14	1-2* 2-3	Enable the IDE hard disk drive controller Disable the IDE hard disk drive controller
J15	1-4 2-3* 3-4	Select the external battery Select the system board battery Discharge CMOS memory (this resets the SETUP values to their factory defaults)
J16	1-2* 2-3	Enable the IDE hard disk drive controller Disable the IDE hard disk drive controller

\* Factory setting

\*\* MSDOS to automatically reassign parallel and serial ports.

### *Built-in VGA jumper settings*

Built-in VGA	J1	J2
Enable	1-2*	1-2*
Disable	Off	Off

\* Factory setting

#### **Note**

To use an external display adapter in an expansion slot, you must disable the built-in VGA adapter.

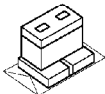

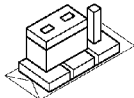
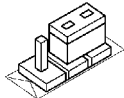
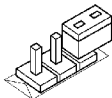
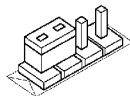
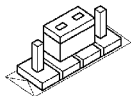
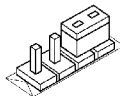
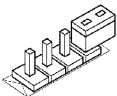
## ***Setting the Jumpers***

Follow these steps to change jumper settings:

1. Refer to the illustration on page 3-6 to locate the jumpers.
2. If the jumper you need to change is blocked by any option cards installed in your computer, you need to remove them to access the jumpers. See page 3-18.

3. A jumper's setting is determined by where the jumper is placed on the pins. Use the following table to identify the pin settings for 2-pin, 3-pin, and 4-pin jumpers. To identify pin 1, look at the system board under the jumper; a triangle is traced on the board at pin 1.

### *Setting jumpers*

Jumper type	Position			
2-pin	On 	Off 		
3-pin	1-2 	2-3 	Off 	
4-pin	1-2 	2-3 	3-4 	Off 

To move a jumper from one position to another, use your fingers, needle-nose pliers, or tweezers to pull it off its pins and gently move it to the desired position.

### **Caution**

Be careful not to bend the jumper pins or damage any components on the main system board.

4. Replace any option cards you removed. See page 3-15 for instructions.

---

## ***Installing Memory Modules (SIMMs)***

Your computer comes with 2MB, 4MB, or 8MB of memory on memory modules-also called SIMMs (single inline memory modules). By installing additional SIMMs, you can increase the amount of memory in your computer up to 16MB. There are four SIMM sockets on the main system board, and each can contain one SIMM. You can install 1MB and 4MB SIMMs.

The following table shows the possible SIMM configurations. Do not install memory in any other configuration. The label on the system board for each SIMM socket (**RAM1** through RAM4) identifies the bank of sockets where you should install SIMMs. (An x indicates that no SIMM is installed in that bank.)

### *SIMM configurations*

<b>BANK 0 (RAM 1 and RAM 2)</b>	<b>BANK 1 (RAM 3 and RAM 4)</b>	<b>Total memory</b>
1MB	x	2MB
1MB	1MB	4MB
4MB	x	8MB
4MB	4MB	16MB

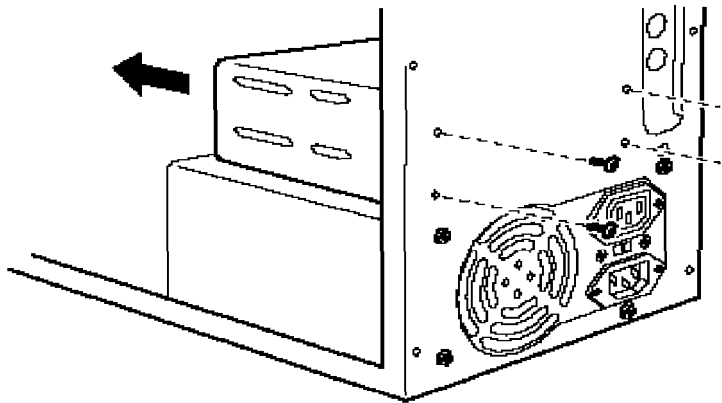
Before you install SIMMs, review the following guidelines to ensure that they will work properly:

- ☐ Use only tin-plated, 30-pin, S-bit or 9-bit, fast-page mode SIMMs that operate at an access speed of 70ns (nanoseconds) or faster. Be sure all the SIMMs operate at the same speed.
- ☐ Use the correct SIMM configuration to add the amount of memory you want. See the table above.
- ☐ Your SIMM sockets may not look exactly like the ones in the illustrations. If you are not sure how to install SIMMs, contact the EPSON Connection.

## ***Inserting SIMMs***

Make sure the computer is turned off and the cover is off. Then follow these steps to install SIMMs:

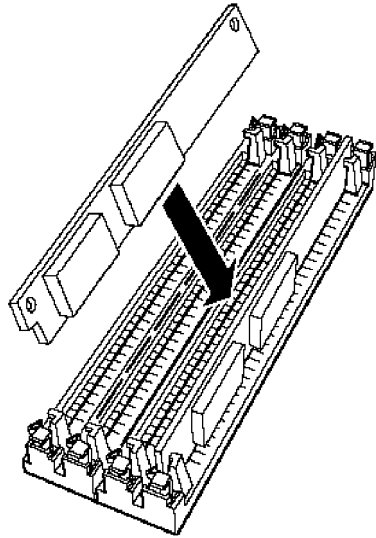
1. Refer to the illustration on page 3-6 to locate the SIMM sockets on the right side of the system board, next to the power supply connector.
2. You need to remove the rear internal drive bay bracket to access the SIMM sockets. (If there is a drive mounted in this bracket, you'll need to remove it first; see Chapter 4 for instructions.) Remove the four screws that hold the bracket to the back of the system, as shown below.



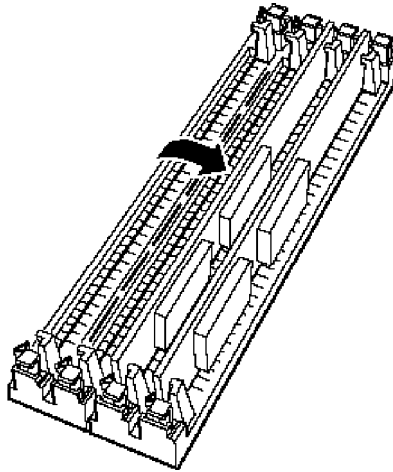
3. Rest the computer on its side, so that the system board is flat and the components on the board are easy to reach.



4. Position the first SIMM at an angle over the first empty socket, as shown below. The components of the SIMM should face the inside of the computer.



5. Push the SIMM into the socket until it is seated firmly in the slot. Then tilt it upright, as shown in the following illustration, guiding the hole at each end of the SIMM over the retaining post at each end of the SIMM socket. If it does not go in smoothly, do not force it; pull it all the way out and try again.



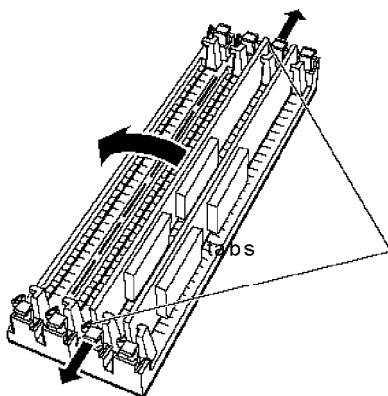
6. Repeat steps 4 and 5 for each additional SIMM.
7. Replace the rear internal drive bracket, if necessary

## ***Removing SIMMs***

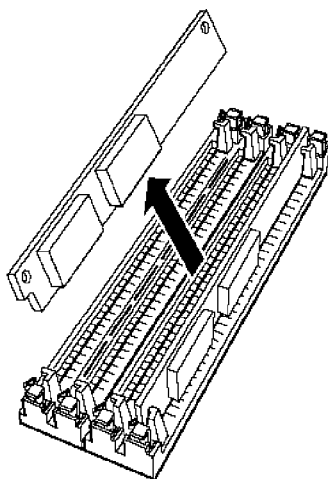
If you need to remove SIMMs from your computer (to install different ones, for example), follow the steps below:

1. Make sure the computer is turned off.
2. Use the illustration on page 3-6 to locate the SIMM sockets on the right side of the system board.
3. You need to remove the rear internal drive bay bracket to access the SIMM sockets. (If there is a drive mounted in this bracket, you'll need to remove it first; see Chapter 4 for instructions.) Remove the four screws that hold the bracket to the back of the system, as shown on page 3-11.
4. Set the computer down on its side

5. Use your fingers or a small screwdriver to carefully pull away the tabs that secure the SIMM at each end. As you pull away the tabs, the SIMM falls to the side.



6. Remove the SIMM from the socket



7. If necessary, follow the same procedure to remove other SIMMs.

8. If you are inserting different SIMMs, follow the instructions on page 3-1 1 to install them.
9. Replace the rear internal drive bracket (see Chapter 4) if you removed it.

---

## ***Installing an Option Card***

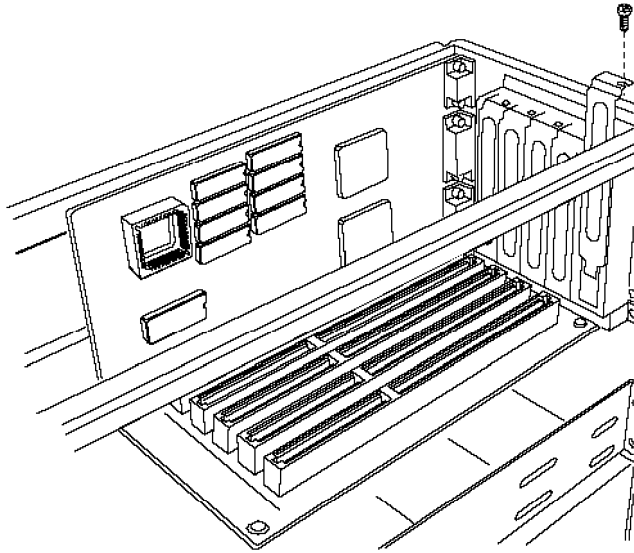
This section explains how to install option cards in your computer. Your computer has five ISA-compatible 16-bit, full-length option slots.

As you install option cards, keep these general guidelines in mind.

- ☐ Make sure the power requirements for the option cards you install do not exceed the power supply limitations. See your option card manual(s) for the power requirements. Then check Appendix A for the option slot power limits.
- ☐ You can install an 8-bit card in a 16-bit slot, as long as it fits.
- ☐ When you unpack the option card, be careful not to touch any of the components on the circuit board or the gold-edged connectors. If you need to set it down before you install it, place it gently on top of its original packing material with the component side facing up. Keep the packing materials in case you remove the card later.
- ☐ Before you install the card, adjust any switches or jumpers on the card, if necessary. (See the option card instructions.) Also, see if you need to change any jumper settings on the system board. For example, if you install a video card, you need to disable the built-in VGA adapter. See page 3-7 for more information on jumpers.

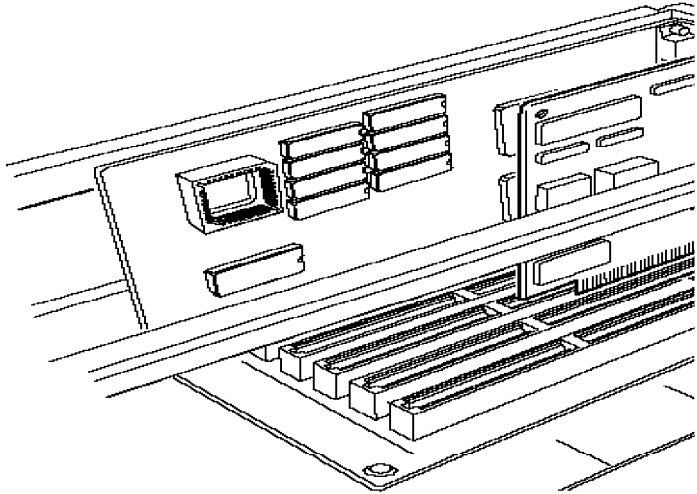
To install an option card, make sure the computer is turned off and the cover is off. Then refer to the illustrations below and follow these steps:

1. Remove the retaining screw securing the option slot cover to the computer, as shown below. (Keep the screw to secure the option card to the computer.)



2. Slide out the slot cover and set it aside. (Store it in a safe place in case you remove the option card later.)
3. Unpack the option card and carefully adjust any switches or jumpers on it, if necessary. (Check the option card instructions.)

4. Hold the card along the top corners and guide it into the slot, as shown below. (If you are installing a full-length card, insert the front edge of the card into the corresponding guide inside the computer's front panel.)



Once the connectors reach the slot, push the card in firmly (but carefully) to insert it fully. You should feel it fit into place. If the card does not go in smoothly, do not force it; pull it all the way out and try again.

5. Secure the end of the card to the computer with the retaining screw.

---

## ***Removing an Option Card***

You may need to remove an option card to access components on the main system board-to change a jumper setting, for example. You may also want to remove a card if you no longer need it. Refer to the illustration on page 3-17 and follow these steps:

1. Remove the retaining screw securing the option card to the computer. Then pull the card straight out of the slot.
2. Set the card aside with the component side facing up.
3. If you are not installing another option card, replace the option slot cover and retaining screw.

---

## ***Adding Video Memory***

Your computer comes with at least 512KB of video memory. If you have 512KB of video memory, you can increase it to 1MB by installing four video DRAM DIP (dual inline package) chips. The chips must be 20-pin, 256KB, 80ns or 80ns. Additional video memory is useful for running graphics-intensive applications or for supporting high resolutions up to 1280 x 1024 in 16 colors (interlaced) on your monitor. See Appendix A for a table identifying supported colors and resolutions for each amount of video memory.

## ***Installing the Video Chips***

You need to install four video DRAM DIP chips to upgrade the memory. For the memory to work properly, you must install one chip in each empty video memory socket on the system board. Note that your video memory sockets may not look exactly like the ones in the illustrations. If you are not sure how to install video memory chips, contact the EPSON Connection.

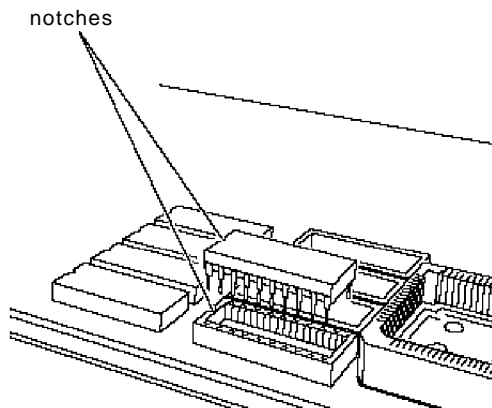
Follow these steps to install video memory:

1. Locate the video memory chip sockets on the main system board, shown on page 3-6.
2. If there is an option card in your way, remove it. See page 3-18 for instructions.

**Caution**

To avoid generating static electricity and damaging the memory chips, ground yourself by touching the metal surface on the inside of the computer's back panel. Then remain as stationary as possible while you install them.

3. Remove the memory chips from their package and inspect each one. The pins should point inward at slightly less than a 90° angle. If any pins are not in this position, use your fingers or small tweezers to gently align them with the others. Be careful; the pins are fragile and can break easily.
4. Position the memory chip over the first empty socket as shown below, aligning the pins on the chip with the holes in the socket. Make sure the small notch on the end of the chip aligns with the corresponding notch in the socket.





5. Gently press the chip halfway into the socket (to make sure it is correctly aligned). If the chip does not go in smoothly, remove it and try again.
6. When the chip is properly positioned, push down firmly on both ends of the chip to make sure it is well-seated.
7. Repeat steps 4 through 6 to install the remaining chips.
8. Replace any option cards you removed. See page 3-18 for instructions.

---

## ***Installing the Math Coprocessor***

You can enhance your system's performance for some applications by installing a math coprocessor. If you have a 486SLC-33 system, use a Cyrix 83S87-33 coprocessor. If you have a 486SLC2-50 system, use a Cyrix 83S87-25 coprocessor.

Note that your math coprocessor socket may not look exactly like the one in the illustration. If you are not sure how to install a math coprocessor, contact the EPSON Connection.

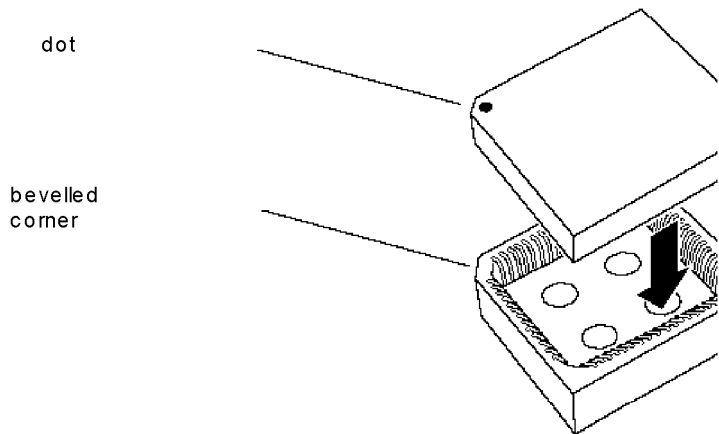
To install the math coprocessor, follow the instructions in the manual that came with it, or follow these steps:

1. Use the illustration on page 3-6 to locate the processor socket on the system board.

### **Caution**

Make sure you ground yourself by touching the metal surface on the inside of the computer's back panel before you touch the coprocessor. Then remain as stationary as possible while you install it. Do not touch the pins on the coprocessor; handle it only by the edges.

2. If there is an option card in the way, remove it. See page 3-18 for instructions. If necessary, disconnect any drive ribbon cables to move them out of your way. (See Chapter 4).
3. Remove the processor from its package and inspect it. If the pins appear bent or crooked, do not install the coprocessor. You may need to replace it.
4. Position the coprocessor chip over the socket, aligning the notched edge of the chip (marked with a dot) with the bevelled corner in the socket, as shown below. Then gently push the coprocessor straight into the socket, pressing evenly and firmly on all sides.

**Caution**

If you install the chip in the wrong orientation, you may damage the chip and void your warranty.

5. Replace any option cards you removed. See page 3-15 for instructions.
6. Replace any drive ribbon cables you disconnected. Then replace the computer's cover.

---

## ***Post-installation Procedures***

After you install or remove options such as memory modules or a microprocessor, you must run SETUP to update the computer's configuration. See Chapter 1 for instructions. Additionally, you may need to add some commands to your configuration files. See your operating system manual and the manual that came with your optional equipment.

## Chapter 4

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# Installing and Removing Drives

This chapter describes how to install and remove optional drives in your computer. You can use these instructions to install a variety of devices, including hard disk drives, a diskette drive, a tape drive, a CD-ROM drive, or an optical drive. Although your drive may look different from the ones illustrated here, you should be able to install it the same way.

Your computer can hold up to seven mass storage devices, as described in the table below.

Drive bay	Drive type and size
Four externally accessible bays	Two 5.25-inch, half-height drives or one 5.25-inch, full-height drive and two 3.5-inch, third-height drives
One front internal bay	One 3.5-inch, half-height or third-height drive
Two rear internal bays	Two 3.5-inch, half-height or third-height, or one 3.5-inch, full-height drive

---

### Note

The main system board in your computer supports up to two diskette drives (or one diskette drive and one tape drive) and up to two IDE hard disk drives. If you install more than four drives, you must install a drive controller on an option card, such as a SCSI controller card, for the additional drive(s).

---

To install or remove a drive, first remove the computer's cover as described in Chapter 3. Then remove any option cards to access the drive bays. Once you have installed the drive, replace any option cards you removed. See Chapter 3 for instructions. Follow the appropriate instructions in this chapter to install and remove drives:

- ☐ Set the IDE hard disk drive jumpers
- ☐ Remove mounting frames
- ☐ Install a drive in the front internal drive bay
- ☐ Remove a drive from the front internal drive bay
- ☐ Install a drive in an external drive bay
- ☐ Remove a drive from an external drive bay
- ☐ Install a drive in the rear internal drive bay
- ☐ Remove a drive from the rear internal drive bay
- ☐ Perform post-installation procedures

Be sure to consult the documentation that came with your drive for additional information.

---

## ***Setting the IDE Hard Disk Drive Jumpers***

Most hard disk drives have jumpers that identify whether the drive is a primary (master) or secondary (slave) drive when you have more than one drive installed. The primary drive loads the operating system into memory when you turn on or reset the computer.

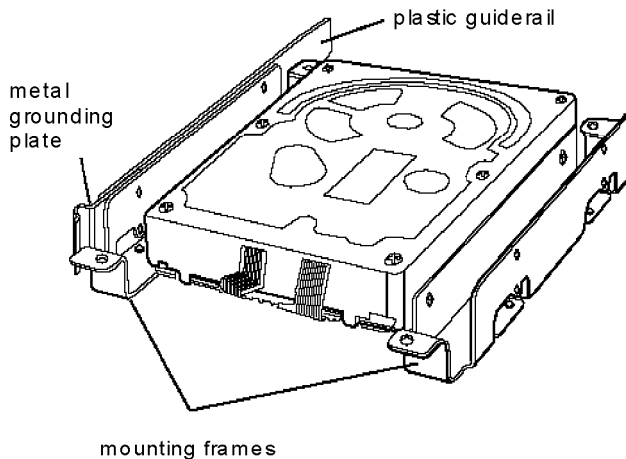
If you are installing the first hard disk drive in your computer, you don't need to change these jumper settings. If you are installing a second hard disk drive, see the table labeled "IDE hard disk drive jumper settings" in Appendix A for the correct jumper settings.

---

## ***Removing Mounting Frames***

If you are installing a drive in a 3 1/2-inch wide drive bay and there are mounting frames attached to the drive, you must remove them before you install the drive. Follow these steps:

1. On your drive, there may be a plastic guiderail and metal grounding plate attached to one of the mounting frames. If so, remove the screws securing them to the mounting frame and remove the guiderail and grounding plate.



2. Then remove the two screws securing each mounting frame to the drive and remove the frames.

---

## ***Installing a Drive in the Front Internal Drive Bay***

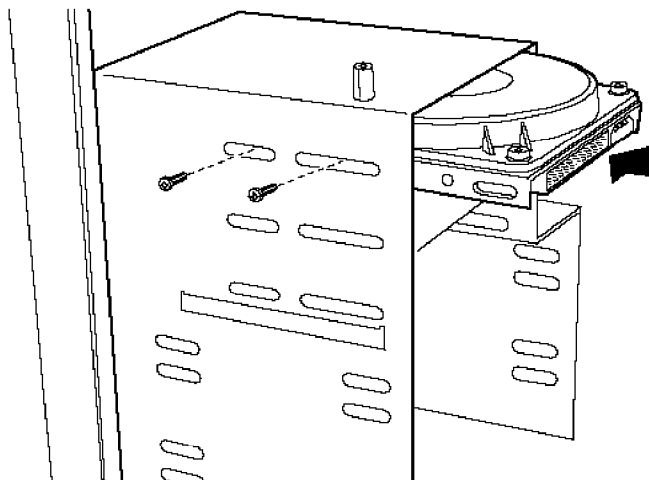
Your computer may have a hard disk drive already installed in the front internal drive bay. If not, you can install a half-height, 3.5-inch hard disk drive in this bay.

### **Note**

You need to know the drive parameters if the hard disk drive auto-sensing feature in SETUP is unable to correctly identify your drive. See the documentation that came with your drive for this information.

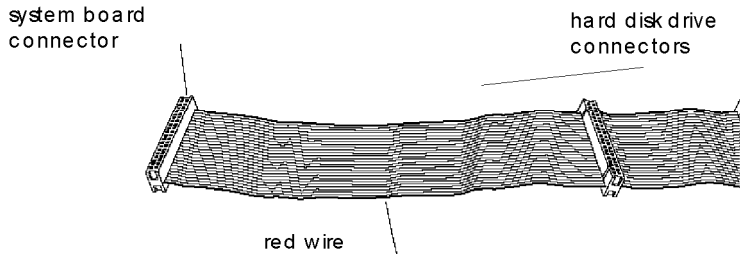
Follow these steps to install the drive in your computer:

1. Position the drive so its drive and power connectors face the back of the computer and its circuit board is on the bottom.
2. Slide the drive into the front internal drive bay as shown below. Align the holes in both sides of the drive with the slots in the drive bay. Then secure the drive to the bay with the four screws (two on each side) that came with it.



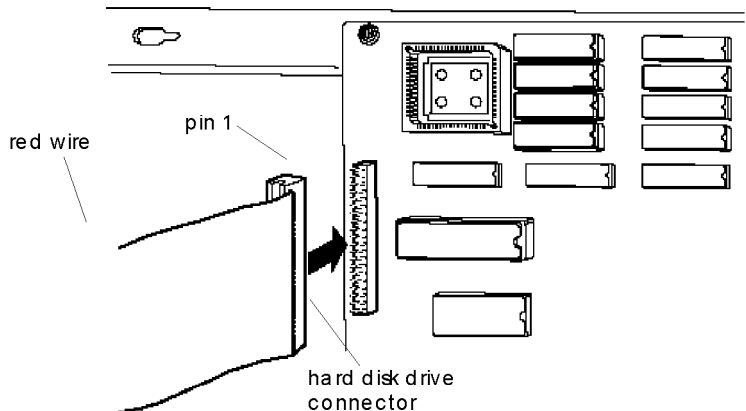
3. If you already have one IDE hard disk drive installed, skip to step 7.

If you just installed your first IDE hard disk drive, you need to connect the hard disk drive ribbon cable to the main system board. Locate the ribbon cable shown below; it came in the box with your computer.



The ribbon cable has a red wire running down one side, a system board connector at one end, and two drive connectors near the other end.

4. Locate the hard disk drive connector on the system board, as shown below.





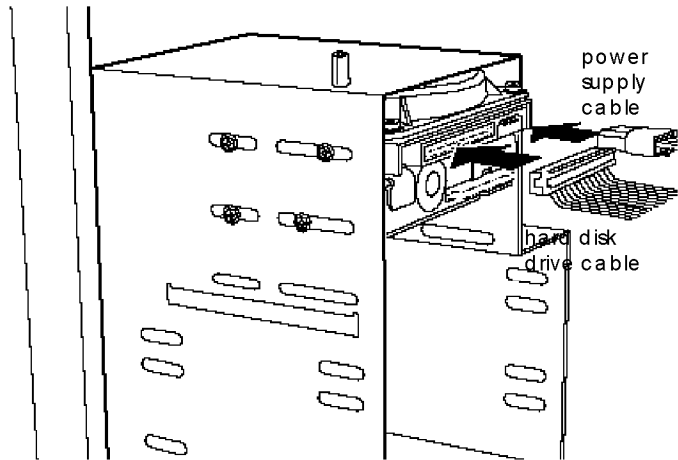
5. Position the drive cable over the system board connector so that the side with the red wire is closest to the pin identification markings “1” and “2” printed on the system board.
6. Make sure the holes in the ribbon cable connector fit over the pins in the system board connector; then push in the ribbon cable connector.

**Caution**

If you do not correctly align the holes with the pins, you could severely damage your system board when you push in the ribbon cable connector.

7. Now locate the side of the hard drive connector that contains pin 1. The number “1” or “2” may be stamped on the connector casing or printed on the drive’s circuit board to identify the side of the connector containing pin 1. If the number does not appear on the connector casing, remove the drive and turn it over to check the circuit board.

8. Position the connector on the drive ribbon cable so the red wire aligns with the side of the drive connector containing pin 1. Make sure the holes in the ribbon cable connector fit over all the pins; then push in the connector.



9. Locate one of the cables that lead from the power supply. (They have multi-colored wires and a plastic connector on the end.) Align the notched corners of the power supply connector and the drive's power connector; then push in the connector.

**Note**

The power supply has two small and three large cables. If you need another cable, you must use a Y cable, which allows you to create two cables from a single cable. Most computer accessory stores carry Y cables.

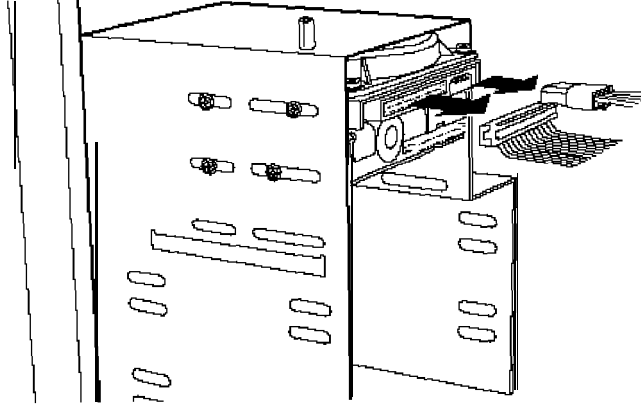
10. If you have finished installing or removing drives, replace the computer's cover (described in Chapter 3) and see page 4-19 for post-installation instructions.

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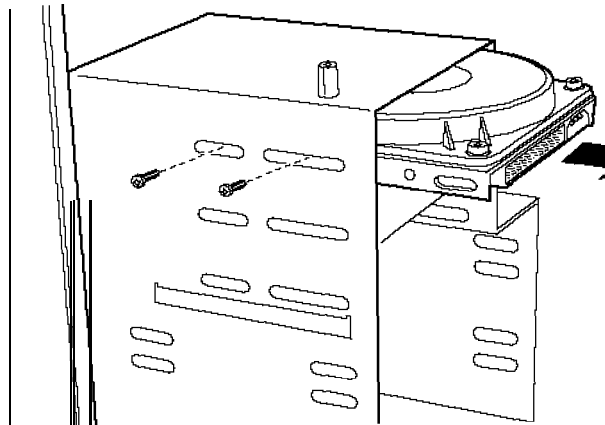
## ***Removing a Drive From the Front Internal Drive Bay***

Follow these steps to remove a drive from the front internal drive bay:

1. Remove the drive and power cables from the back of the drive.



2. Remove the four screws securing the drive to the drive bay. There are two screws on each side of the drive.



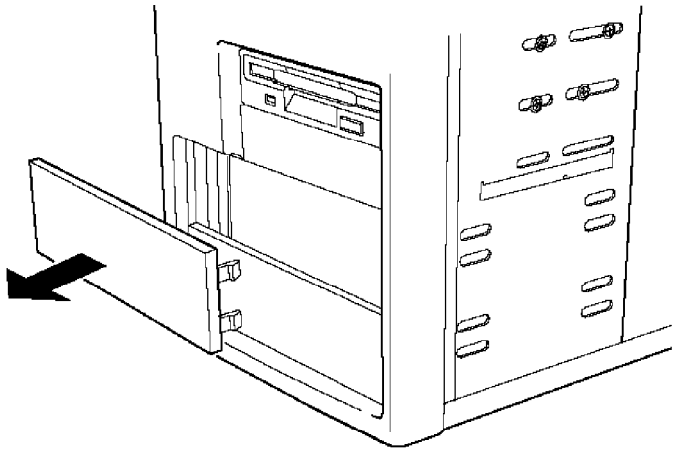
3. Slide the drive out the back of the bay.
4. If you removed your only IDE hard disk drive, remove the hard disk drive ribbon cable from its connector on the main system board.
5. If you have finished installing or removing drives, replace the computer's cover (described in Chapter 3) and see page 4-19 for post-installation instructions.

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## ***Installing a Drive in an External Drive Bay***

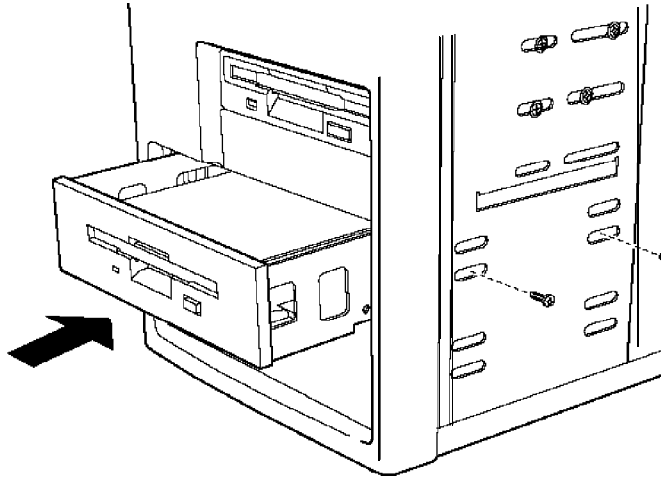
Follow these steps to install a drive in an externally accessible drive bay:

1. Remove the slot cover from the drive bay you are going to use. Reach through the back of the bay and push the slot cover out the front of the bay



2. Position the drive so its drive and power connectors face the back of the computer.

3. Slide the drive into the front of the bay and secure it to the bay using the four screws (two on each side) that came with the drive



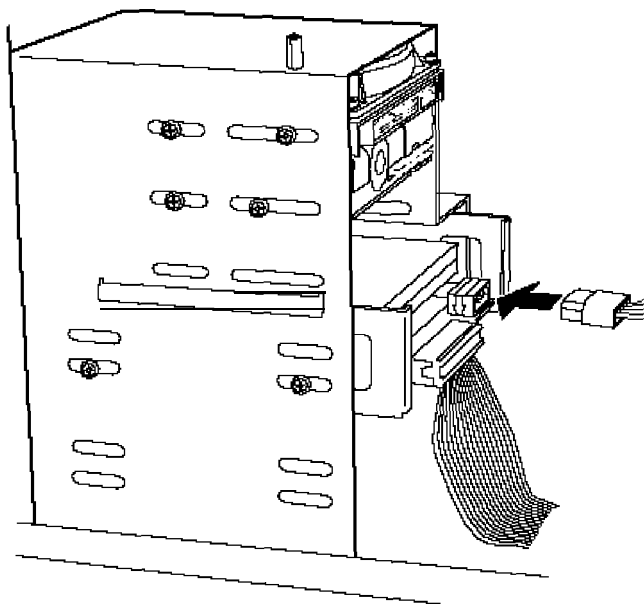
4. Connect the appropriate drive ribbon cable to the drive.

If you are installing an IDE hard disk drive, see page 4-5 for instructions on connecting the ribbon cable to the main system board (if necessary) and the drive.

If you are installing a diskette or tape drive, use the appropriate connector on the diskette drive ribbon cable. If your drive has a header connector, be sure to align pin 1 of the drive connector with the side of the ribbon cable containing the red wire. If your drive has a card-edge connector, align the key-way in the ribbon cable connector with the gap in the drive connector.

If you are installing another type of drive, see the documentation that came with it for instructions on connecting its drive ribbon cable.

5. Now locate one of the power supply cables that lead from the power supply. (They have multi-colored wires and a plastic connector on the end.) Align the notched corners of the ribbon cable's connector and the drive's power connector; then push in the connector.



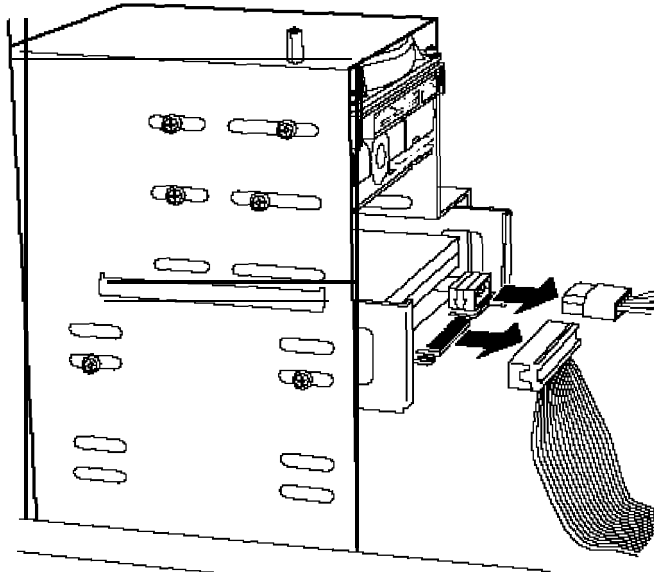
6. If you have finished installing or removing drives, replace the computer's cover (described in Chapter 3) and see page 4-19 for post-installation instructions.

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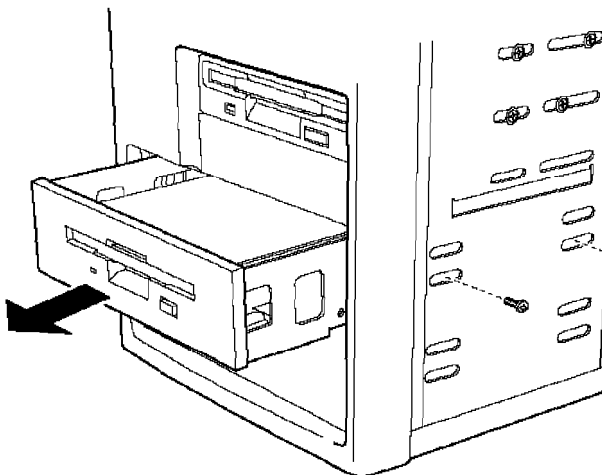
## ***Removing a Drive From an External Drive Bay***

Follow these steps to remove a drive from an externally accessible drive bay:

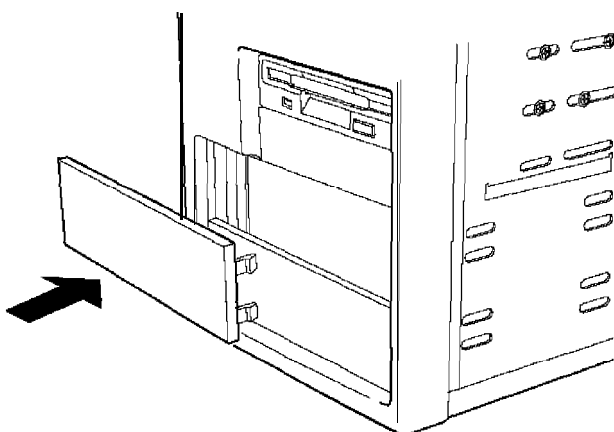
1. Disconnect the drive and power cables from the back of the drive you will remove.



2. Remove the four screws (two on each side) securing the drive to the drive bay. Then slide the drive out through the front of the bay.



3. If you are not installing an externally accessible drive in the open drive bay, you need to install a drive slot cover for that bay. Push the slot cover into the open bay until the tabs on the cover click into place.





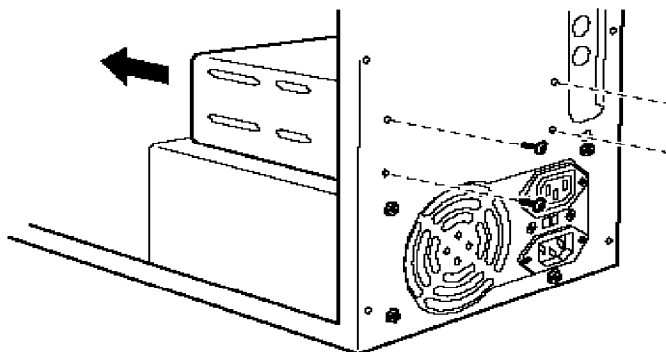
4. If you removed your only IDE hard disk drive, be sure to remove the IDE ribbon cable from the main system board.
5. If you have finished installing or removing drives, replace the computer's cover (described in Chapter 3) and see page 4-19 for post-installation setup instructions.

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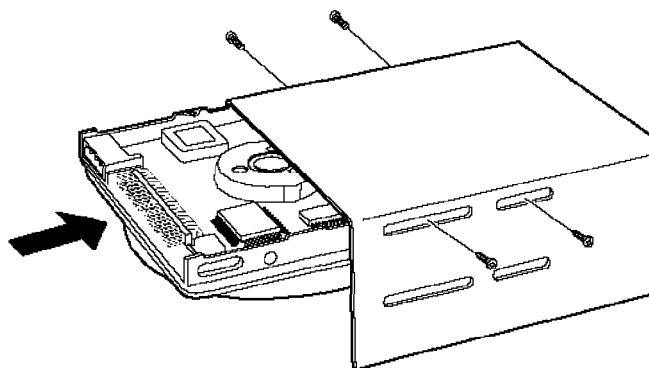
## ***Installing a Drive in the Rear Internal Drive Bay***

The illustrations in this section show the internal drive bay bracket with its open side facing down, but you can also install it with its open side facing up. Follow these steps to install a drive in the rear internal drive bay:

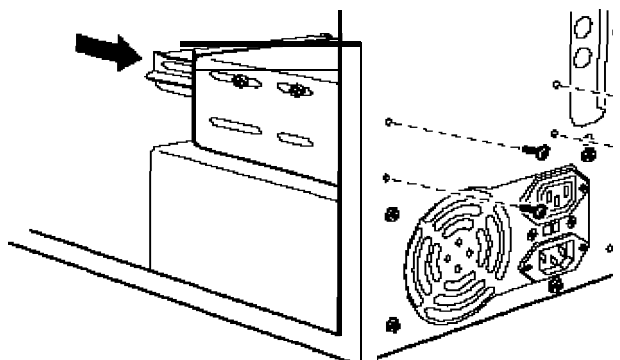
1. If you already have a drive installed in the rear internal drive bay, remove the cables from the back of the drive so you can remove the drive bracket from the computer.
2. If you will be installing your first IDE hard disk drive, you need to connect the hard disk drive ribbon cable to the main system board; see the instructions on page 4-5.
3. Remove the four screws securing the rear internal drive bay bracket to the computer's back panel. Then slide the bracket out of the computer.



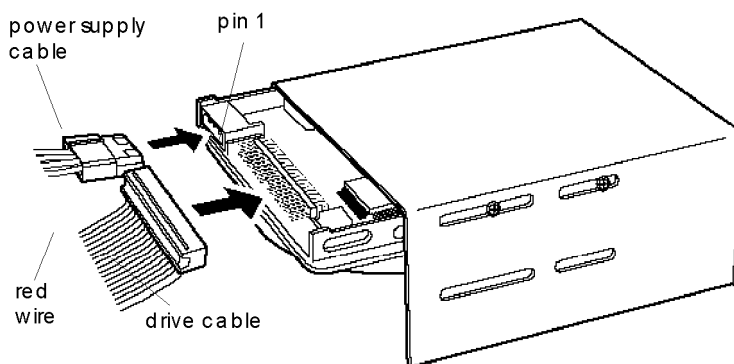
4. Place the bracket; drive on your work surface as shown in the illustration below.
5. Position the drive so that its drive and power connectors face the end of the bracket, as shown below. Then slide the drive into the appropriate bay in the bracket and secure it with the four screws that came with the drive.



6. Place the bracket into the computer as shown below and secure it to the back panel with the four screws you removed from the back of the computer.



7. To connect the drive ribbon cables to the drives in the rear internal bay, first locate pin 1 on each drive's connector. The number "1" or "2" may be stamped on the connector casing or printed on the drive's circuit board to identify the side of the connector containing pin 1. If the number does not appear on the connector casing, remove the drive and turn it over to check the circuit board.
8. Hold the connector on the drive ribbon cable so the red wire aligns with pin 1 on the drive. Make sure the holes in the connector fit over all the pins; then push in the connector.



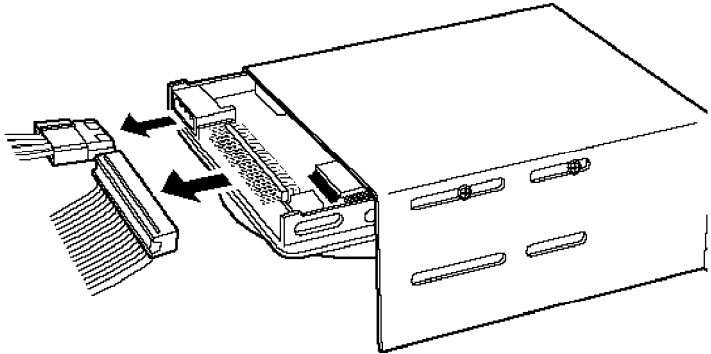
9. Locate a power supply cable for each drive installed in the rear internal bay. These cables lead from the power supply and have multi-colored wires with a plastic connector on the end. Align the notched corners of the power supply connector with the drive's power connector; then push in the connector.
- 10 If you have finished installing or removing drives, replace the computer's cover (described in Chapter 3) and see page 4-19 for post-installation instructions.

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## ***Removing a Drive From the Rear/Internal Drive Bay***

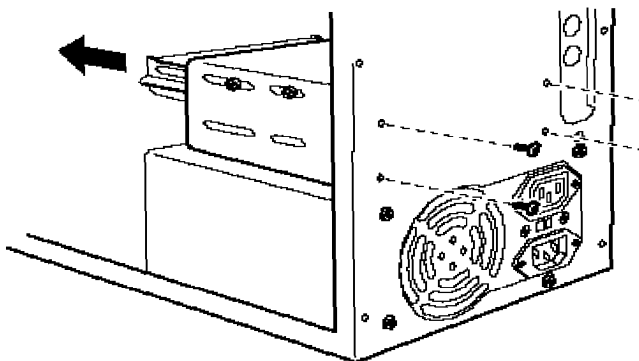
Follow these steps to remove a drive from the rear internal drive bay:

1. Remove the drive ribbon cable and power cable from the back of each drive in the rear internal bay.

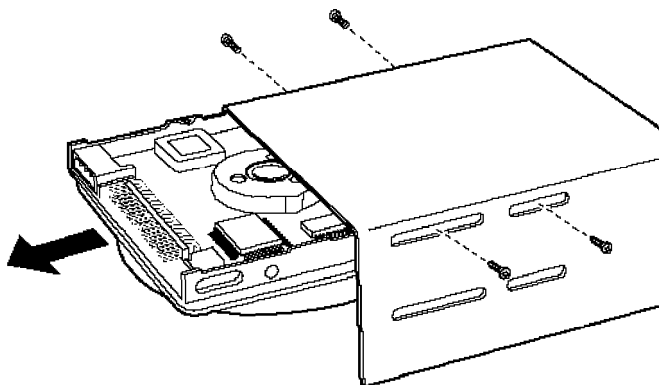


2. If you will be removing your only IDE hard disk drive, disconnect the hard disk drive ribbon cable from its connector on the main system board.

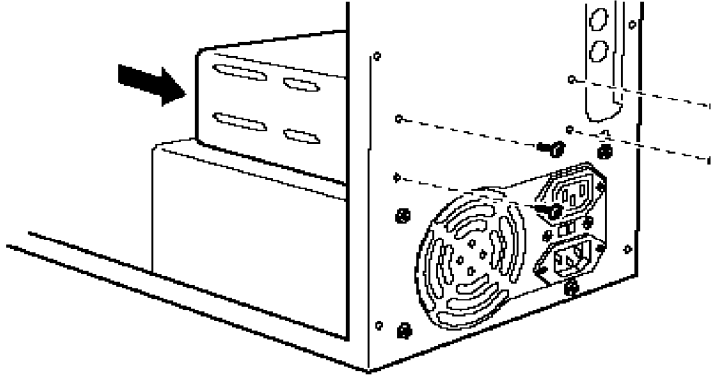
13. Remove the four screws securing the drive bay bracket to the computer's back panel. Then slide the bracket out of the computer



4. Remove the four screws securing the drive to the bracket and slide the drive out of the bracket.



5. Replace the bracket inside the computer as shown below and secure it to the back panel with the four screws you removed earlier.



6. If there is another drive installed in the rear internal drive bay, follow the instructions on page 4-16 to reconnect the drive and power cables to the drive.
7. When you are finished installing or removing drives, replace the computer's cover (described in Chapter 3) and see the next section for post-installation instructions.

---

## ***Post-installation Procedures***

After you install or remove your drive(s) and replace the cover on your computer, you need to run SETUP to define your new drive configuration. See Chapter 1 for instructions.



# **Chapter 5**

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## ***Troubleshooting***

If you have any problems as you set up and use your computer, refer to this chapter. You can correct most problems by adjusting a cable connection, repeating a software procedure, or resetting the computer.

The troubleshooting suggestions in this chapter are organized in general categories, such as “The computer will not start.” Within each category, a more specific problem is described with possible solutions.

If the suggestions here do not solve the problem, contact your Authorized EPSON Servicer. See “Where to Get Help” in the introduction of this manual for instructions.

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### ***Identifying Your System***

When you request technical assistance, be ready to provide the serial number of your computer, its system BIOS version number, its configuration (including the type of disk drives, monitor, and option cards), and the names and version numbers of any software programs you are using.



Use these guidelines to locate information about your system.

**Serial number:** Look on the back panel of the computer to find the serial number.

**System BIOS version:** Restart your system. You'll see the system BIOS version number displayed on the screen when your system performs power-on diagnostics.

**System configuration:** Start SETUP and select the System Summary option to see your system's configuration.

**MS-DOS version:** At the MS-DOS prompt, type `VER` and press **Enter** to see the MS-DOS version number.

**Software versions:** In Windows applications, select About from the Help menu. As your software application starts, it usually displays a version number on the banner screen. Also, you can check your software manual.

**CONFIG.SYS:** At the MS-DOS prompt, type `TYPE C:\CONFIG.SYS` and press **Enter** to see a listing of your CONFIG.SYS file, which contains system configuration commands.

**AUTOEXEC.BAT:** At the MS-DOS prompt, type `TYPE C:\AUTOEXEC.BAT` and press **Enter** to see a listing of your AUTOEXEC.BAT file, which contains your system startup commands.

---

## ***The Computer Will Not Start***

### ***The power light is on, but the computer does not start***

Place a bootable diskette in drive A and turn on the computer again.

#### **Caution**

If you turn off the computer, always wait at least 20 seconds before turning it back on. This prevents damage to the computer's electrical circuitry.

### ***The computer does not start and the powerlight is not lit***

Make sure the power cord is securely connected to both the AC inlet on the back panel and an electrical outlet.

### ***The power cord is securely connected, but the computer still does not start.***

Check the electrical outlet for power. Turn off your computer and unplug the power cord. Plug a lamp into the outlet and turn it on.

### ***You installed or removed system components, and now your computer does not start.***

Check to make sure you have reconnected all the internal and external cables correctly.

You may have installed a SIMM incorrectly. If the system doesn't detect memory, it won't start. Check that your SIMM(s) are securely installed in their sockets.

---

## ***The Computer Does Not Respond***

### ***The computer locks up.***

Wait a few moments; if your computer does not respond after a reasonable length of time, press **Ctrl Alt Del**. If that doesn't work, press the RESET button.

You may have installed memory using SIMMs that work at the wrong speed. You can try using the SETUP program to insert a wait state (see Chapter 1) or you can install the correct SIMMs (see Chapter 3).

Your system may have overheated because its physical environment is too warm. Allow the system to cool and relocate it, if necessary.

### ***You reset the computer, but it still does not respond.***

Try turning the computer off, wait 20 seconds, and turn it on again.

---

## ***Keyboard Problems***

### ***The screen displays a keyboard error message when you turn on or reset the computer.***

Make sure the keyboard is securely connected to the keyboard port and not the mouse port. Although these ports look alike, they cannot be used interchangeably.

### ***Nothing happens when you type on the keyboard.***

See "The Computer Does Not Respond," above.

***The cursor keys on the numeric keypad do not work properly.***

If the Num Lock light in the upper right corner of the keyboard is lit, press **NumLock** to turn off the function.

If you want to change the initial settings of the num lock function, see “Setting Keyboard Options” in Chapter 1.

---

## ***Mouse Problems***

***Your mouse isn't working properly or you see an auxiliary device error message.***

Make sure the mouse cable is securely connected to the **MOUSE** port and not the K/Bport. Also make sure you installed the mouse driver correctly (if necessary). See the documentation that came with your mouse and Chapter 1 for instructions. (The Windows installation program automatically installs a mouse driver for Windows applications.)

---

## ***Monitor Problems***

***There is no display on the screen.***

Check that the monitor's power switch is on and that its power light is lit.

***The power light is on, but you still do not see anything on the screen.***

Check the brightness and contrast controls.

If you still do not see anything on the screen, make sure the monitor is securely connected to the computer.

If you installed a display adapter card, make sure your monitor and display adapter match. Also check to see if the card's switches or jumpers and the jumpers on the system board are set properly. See Chapter 3 for system board jumper information.

If you are running an application program, see if you need to set up the program for the type of monitor and display adapter you have. Also make sure you are using the appropriate monitor and display adapter for your software.

### ***The powerswitch is on but the powerlight is not on.***

Turn off the monitor's power, wait five seconds, and turn it back on.

If the light still does not come on, check the electrical outlet for power. Turn off your monitor and unplug it from the outlet. Then plug a lamp into the wall outlet and turn it on. If the light turns on, your monitor may be faulty.

---

## ***Diskette Problems***

### ***You see a diskette error message.***

Reinsert the diskette, making sure you insert it all the way. If the drive has a latch, turn it down to secure the diskette.

Also, check to see that you have inserted the right type of diskette in the drive. For example, make sure you are not inserting a high-density diskette in a double-density drive

If reinserting the diskette does not solve the problem, insert the diskette in another diskette drive of the same type. If you can read the diskette in a different drive, your drive may be faulty.

***The diskette is the tight type, but you still see an error.***

Check that the diskette is not write-protected, preventing the drive from writing to the diskette.

Make sure the diskette is formatted. See your operating system documentation for instructions on formatting diskettes.

You may have a defective diskette. Try copying the files from the bad diskette to a new diskette.

***Something is wrong with the data in the files***

If you are using MS-DOS, use SCANDISK or CHKDSK to repair the files. You may also be able to use special utilities or diagnostics to solve this problem.

---

***Diskette Drive Problems***

***A newly installed diskette drive is not working properly.***

Make sure you have installed the drive correctly and check all the cable connections.

***You see a diskette drive error when you start your computer.***

Run the SETUP program and configure your system for the correct type of diskette drive. Also check the jumper setting of J13 to make sure the diskette drive controller is enabled.

***The diskette drive is making loud or unusual noises***

Contact your Authorized EPSON Servicer.

---

## ***Hard Disk Drive Problems***

### ***A newly installed hard disk drive is not working properly.***

Make sure you have installed the drive correctly and check all cable connections. Also, check the jumper settings on your drive.

### ***You see a hard disk drive error when you start your system.***

Run SETUP and check that your system's auto-sensing feature is detecting the correct drive type. If auto-sensing is enabled and SETUP displays information that does not match your drive, you may need to define your own drive type. See Chapter 1.

Make sure the jumpers on the system board are set correctly. Jumpers J14 and J16 enable or disable the IDE hard disk drive controller. See Chapter 3 for jumper information.

Make sure the jumpers on the hard disk drive are set correctly. See the documentation that came with the drive for more information.

### ***You are unable to store data on the hard disk drive.***

If your drive was not configured, make sure you have partitioned and formatted the drive correctly for your operating system. See your operating system manual for instructions.

Also, make sure your hard disk drive has been physically formatted by the manufacturer. (All EPSON-supplied drives are physically formatted at the factory.) If it has not been physically formatted, use the format utility that came with the drive to format it before you partition it or install the operating system.

Note that a physical format is different from the action of commands such as MS-DOS FORMAT.

***You have been using your hard disk drive successfully for some time but notice a reduction in performance.***

The data on the disk may have become fragmented. Back up all your data and use a disk compaction utility to reorganize the files on your disk.

If you cannot access data on your hard disk or you are seeing read/ write errors, the disk may have a physical problem. Contact your Authorized EPSON Servicer.

---

## **Software Problems**

***The application program does not start***

Check that you are following the correct procedure for starting the program and that it is installed correctly. If you do not have a hard disk, make sure the correct diskette is in the diskette drive. If you need help, contact your software manufacturer.

***The application program is having trouble reading a key disk.***

You may be running an application that requires a slower operating speed. You need to change the system speed using a simple keyboard command. See Chapter 2 for information on setting the processor speed.

***Your application has locked the computer, making it unresponsive to keyboard commands***

Reset the computer and try again. If resetting the computer does not help, turn it off, wait 20 seconds, then turn it on again.



Some software, like OS/2,<sup>®</sup> UNIX,<sup>®</sup> or NetWare<sup>®</sup> 3.11, needs a minimum of 8MB to 16MB of RAM to work correctly. Check your software documentation for the minimum memory requirements. If necessary, add memory modules using the instructions in Chapter 3.

---

## ***Printer Problems***

### ***The printer does not work at all.***

Check that the printer has power and is properly connected to the computer. Make sure your printer has paper in it.

Make sure the computer's jumpers are set correctly. Also, make sure your operating system is assigning ports correctly.

If you are using more than one serial port, check the primary and secondary port settings (COM1 and COM2) in your application program.

### ***The printer prints garbled information.***

Check the printer manual for the printer's correct DIP switch or control panel settings.

Also, make sure you have the proper drivers installed for your printer and you've selected the correct printer within your software application.

---

## ***Option Card Problems***

### ***A newly installed option card is not working correctly.***

Make sure the option card is installed correctly, is well-seated in its slot, and is not touching any other card. Run the SETUP program to update your computer's configuration after you install the card and perform setup procedures for any software you are using with the option card.

See the documentation that came with the option card to set any necessary DIP switches or jumpers on the card.

The main system board of your computer may also have some jumpers that must be set for the option card to work properly. See Chapter 3 for system jumper information.

Your system may need to run at the slower speed to access the device. Try reducing the processor speed (see Chapter 2) or inserting a wait state through SETUP (see Chapter 1).

### ***An external device connected to the option card is not working correctly.***

Make sure you are using the proper cable to connect the device to the card.

---

## ***Memory Module Problems***

### ***The memory count displayed by the power-on diagnostics program is incorrect.***

You may have installed the SIMMs incorrectly. They may be the wrong type or speed, or they may not be inserted all the way. See Chapter 3 for information on installing SIMMs.

---

## ***Controller Problems***

***You see a controller error for the drive controllers, the video controller, or the I/O port controllers when you start your system.***

The indicated controller on your system board may be faulty. If you have an option card with a controller that will work with your device, you can install it and change the jumper settings on the system board to disable the built-in controller. You can then continue to use your system until it is convenient for you to have it serviced.

If the error message refers to your diskette drive or hard disk drive controllers, make sure the jumpers for these devices are set to enabled. See Chapter 3.

---

## ***Internal Battery Problems***

***The screen displays an error message prompting you to run SETUP when you start your system, or your system displays the incorrect time and date***

If your system has not been used for an extended period of time, your internal NiCad backup battery may be discharged. First, run SETUP to enter the correct time and date. (You may also need to re-enter your computer's configuration information.) See Chapter 2 for instructions. Then, keep your system running for several hours to recharge the NiCad battery.

## Appendix A

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# Specifications

### **CPU and Memory**

<b>32-bit CPU</b>	Cyrix 486SLC-33 SLC2-50 microprocessor
<b>System speed</b>	Fast and slow speeds available; fast speed is the speed of the microprocessor (see above), slow speed is 8 MHz; set speed through keyboard commands or SETUP
<b>Memory</b>	2MB, 4MB, or 8MB RAM standard on SIMMs; expandable to 16MB using 1MB or 4MB SIMMs; SIMMs must be tin-plated, 30-pin, S-bit or 9-bit, fast-page mode type with access speed of 70ns or faster
<b>ROM</b>	128KB Phoenix® system BIOS, video BIOS, and SETUP code located in EPROM on main system board
<b>Video RAM</b>	At least 512KB DRAM on main system board; expandable to 1024KB (1MB) using four 4 x 4 x 256 DIP-type DRAM chips
<b>Shadow RAM</b>	Supports shadowing of system and video BIOS ROM into RAM
<b>Memory relocation</b>	Supports relocation of 128KB of memory from A0000h to BFFFFh
<b>Cache</b>	1KB of internal cache
<b>Math coprocessor</b>	Support for Cyrix 83S87-33 or 83S87-25

***Clock/  
calendar***

Real-time clock, calendar, and 114 bytes of CMOS RAM socketed on main system board with built-in rechargeable NiCad battery backup

***Controllers***

***Video***

Cirrus Logic® GD5424 high-speed super VGA local bus controller; provides resolutions up to 1280 x 1024 in 16 colors (interlaced) with 1MB of video RAM

***Diskette***

Controller on main system board supports two diskette drives or one diskette drive and one tape drive

***Hard disk***

IDE interface on main system board supports up to two IDE hard disk drives with built-in controller; BIOS provides hard disk auto-sensing function

***Interfaces***

***Monitor***

VGA interface for fixed or multi-frequency monitor built into system board; 15-pin, D-shell connector

***Parallel***

One standard, S-bit, parallel, bidirectional interface built into main system board; 25-pin, D-shell connector

***Serial***

Two RS-232C, programmable, asynchronous interfaces built into main system board; 9-pin, D-shell connectors

<b><i>Keyboard</i></b>	PSI 2 compatible keyboard interface built into main system board; 6-pin, mini DIN connector
<b><i>Mouse</i></b>	PS/2 compatible mouse interface built into main system board; 6-pin mini DIN connector
<b><i>Optional port</i></b>	Optional 10-pin game port interface on system board; can control joystick functions with the addition of a port connector
<b><i>Option slots</i></b>	Connector card with five full-length, 16-bit, I/O expansion slots; ISA compatible
<b><i>Speaker</i></b>	Internal
<b><i>Mass Storage</i></b>	<p>Seven devices total. Internal mounts: three 3 1/2-inch wide, third-height drives, or three 3 1/2-inch wide, half-height drives; or one full-height drive and one third-height or half-height drive</p> <p>Externally accessible mounts: Two 3 1/2-inch wide, third-height drives and two 5 1/4-inch wide, half-height drives</p>
<b><i>Diskette drives</i></b>	3.5-inch diskette drive, 1.44MB (high-density) or 720KB (double-density); 5.25-inch diskette drive, 1.2MB (high density) or 360KB (double-density); or combination 3.5-inch/ 5.25-inch diskette drive

<b>Hard disk drives</b>	31/2-inch form factor hard disk drive(s), third-height, half-height size or full size
<b>Other devices</b>	Half-height tape drive, CD-ROM drive, or other storage device; 51/4-inch or 31/2-inch with mounting frames

<b>Keyboard</b>	Detachable, two-position height; 101 or 102 sculpted keys; country-dependent main typewriter keyboard; numeric/cursor control keypad; four-key cursor control keypad; 12 function keys
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<b>SETUP Program</b>	Stored in ROM; accessible by pressing F2 during boot
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## ***Physical Characteristics***

<b>width</b>	7.1 inches (181 mm)
<b>Depth</b>	16.25 inches (413 mm)
<b>Height</b>	13.25 inches (337 mm)
<b>Weight</b>	16.25 lb (7.4 kg) with one diskette drive, but without keyboard

## ***Power Supply***

<b>Type</b>	200 Watt, UL478/ TUV, fan-cooled
<b>Input ranges</b>	90-130 VAC; 180-260 VAC
<b>Maximum outputs</b>	+5 VDC at 20 Amps, -5 VDC at 0.5 Amp, +12 VDC at 8 Amps, -12 VDC at 0.5 Amp
<b>Frequency</b>	47 to 63 Hz
<b>Cables</b>	Two to main system board; five to mass storage devices

## ***Environmental Requirements***

Condition	Operating range	Storage range
Temperature	41° to 90° F (5° to 32° C)	-4° to 140° F (-20° to 60° C)
Humidity (non-condensing)	20% to 90%	10% to 90%
Altitude	-330 to 9,900 ft (-100 to 3,000 m)	-330 to 39,600 ft (-100 to 12,000 m)
Maximum wet bulb	68° F (20° C)	134° F (57° C)
Acoustical noise	46.2 d B	N/A



## ***Tested Operating Environments***

Although your system will run most software applications, the following operating environments have been tested for compatibility with your system.

Microsoft MS-DOS 3.1 and later  
Novell®DR DOS®  
Novell NetWare\* 2.2, 3.12, and 4.01  
Novell NetWare Lite  
IBM® OS/ 2  
SCO® UNIX  
SCO Open Desktop  
Microsoft Windows 3.0 and later  
Microsoft Windows WorkGroups  
Microsoft Windows NT

\* Certified as Workstation; tested as File server

Your system has also received Novell's "Yes, NetWare tested and approved" certification as a workstation. As new environments become available, these also will be tested.

## ***Video Memory and Supported Resolutions***

<b>Resolution</b>	<b>Memory Requirements (MB)</b>	<b>Color</b>	<b>Vertical Frequencies (Hz)</b>	<b>Remarks</b>
640 × 480	512KB	256	60/72	8 bits/pixel
	1MB	32K/64K	60/72	16 bits/pixel
	1MB	16.7M (True Color)	60/72	24 bits/pixel
800 × 600	512KB	256	56/60/72	8 bits/pixel
	1MB	32K/64K	56/60/72	16 bits/pixel
1024 × 768	512KB	16	43.5/60/70/72	4 bits/pixel
	1MB	256	43.5/60/70/72	8 bits/pixel
1280 × 1024	1MB	16	43.5	4 bits/pixel

## ***Options Available from EPSON***

Many options for enhancing and supplementing this product are available from EPSON, including the following:

- Monitors
- Keyboards
- Mass storage devices
- Printers
- Operating system software

Call your nearest marketing location for more information on specific options.

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## Hard Disk Drive Types

Your computer comes with a hard disk auto-sensing feature. When you select **AUTO DETECT 1** or **2** for your hard disk type in **SETUP**, the system detects the type of hard disk drive you have installed and fills in the drive information using values in the following table.

### Hard disk drive types

Type	size* (MB)	Cylinders	Heads	Sectors/ Track	Landing Z o n e	Write Precomp	Drive Name
1	81	903	4	46	903	0	CP30084E
2	116	762	8	39	762	0	CP30104H
3	102	1024	12	17	1024	0	ST3123A
4	62	940	8	17	615	300	
5	46	940	6	17	940	512	
6	162	903	8	46	903	0	CP30174E
7	163	332	16	63	332	0	CP30174
8	204	1024	12	34	1024	0	SI3243A
9	112	900	15	17	901	0	
10	325	768	14	62	768	0	SI3390A
11	504	1024	16	63	1024	0	SI3655A
12	49	855	7	17	855	-1	
13	162	1010	6	55	1010	0	AC1170
14	244	1010	9	55	1010	0	AC2250
16	325	1010	12	55	1010	0	AC2340
17	202	989	12	35	989	0	AC1210
18	203	685	16	38	685	0	CFS210A
19	62	1024	7	17	1023	512	
20	30	733	5	17	732	300	
21	122	919	16	17	919	0	ELS127A
22	30	733	5	17	733	300	
23	162	1011	15	22	1011	0	ELS170A
24	234	723	13	51	723	0	LPS240A
25	240	895	10	55	895	0	CP30254
26	327	665	16	63	665	0	CP30344

### Hard disk drive types (continued)

Type	Size* (MB)	Cylinders	Heads	Sectors/ Track	Landing Zone	Write Precomp	Drive Name
27	515	1048	16	63	1048	0	CFA540A AC2540
28	406	826	16	63	826	0	CF3420A
29	125	1002	8	32	1002	0	7131A
30	234	967	16	31	967	0	7245A
31	329	790	15	57	790	0	7345A
32	40	809	6	17	809	128	
33	48	830	7	17	830	0	
34	68	830	10	17	830	0	
35	42	1024	5	17	1024	0	
36	68	1024	8	17	1024	0	
37	40	615	8	17	615	128	
38	104	1024	8	26	1024	0	
39	69	925	9	17	925	0	
40	76	1024	9	17	1023	0	
41	114	918	15	17	917	0	
42	124	1001	15	17	1001	0	ST3145A
43	136	823	10	34	822	0	
44	Auto-detect 1						
45	Auto-detect 2						
46	User-defined 1						
47	User-defined 2						

\* Actual formatted size may be slightly different from size on drive label; you cannot change this value.

## Drive Option Information

Hard disk drive options for 1-inch IDE drives

Parameters	Conner®							Quantum®		Western Digital®		
	CP-30084E	CP-30104H	CP-30174E	CP-30254	CP-30344	CFS420A	CFA540A	ELS170AT	LPS240AT	AC1170	AC2250	AC2340
Formatted capacity (MB)	85	120	170	250	340	420	540	170	245	170	240	340
Size, width×height (in)	4×1	4×1	4×1	4×1	4×1	4×1	4×1	4×1	4×1	35×1	35×1	35×1
Weight (lbs)	1.3	1.3	1.3	1.2	1.2	1.16	1.16	0.91	1.05	1.12	1.12	1.12
Cylinders	1806	1524	1806	1866	2116	2388	2805	1536	1818	2233	2233	2233
Disks	1	2	2	2	2	2	2	2	2	1	2	2
Heads	2	4	4	4	4	4	4	4	4	2	3	4
Sectors per track	46	39	46	62	63-96	63-100	72-114	54	44-87	56-96	56-96	56-96
Rotational speed (RPM)	3822	3399	3833	4542	4500	3600	4500	3663	4306	3322	3322	3322
Buffer size (KB)	32	32	32	64	64	32	256	32	256	64	64	128
Average seek time (ms)	17	<19	17	14	13	14	12	17	16	<13	<13	<13
Encoding method	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7	RLL 1,7
Power dissipation (seek)	3.75W	3.9W	3.75W	3.75W	3.75W	5.12W	5.7W	4.0W	4.9W	5.2W	5.2W	5.2W
Logical parameters												
Cylinders	903	762	903	895	655	826	1048	1011	723	1010	1010	1010
Heads	4	8	8	10	16	16	16	15	13	6	9	12
Precomp zone	0	0	0	0	0	0	0	none*	none*	1011	1011	1011
Landing zone	903	762	903	895	655	1048	1048	1011	723	1011	1011	1011
Sectors	46	39	46	55	63	63	63	22	51	55	55	55

\* Select 1 or none for the precomp value. If neither of these options are available, select the maximum available precomp value.

### *IDE hard disk drive jumper settings*

Model number	Single drive	Master drive	Slave drive
Conner CP30084E	C/D jumpered	C/D jumpered	No jumpers
Conner CP30104H	C/D jumpered	C/D, DSP jumpered	No jumpers
Conner CP30174E	C/D jumpered	C/D jumpered	No jumpers
Conner CP30254	C/D jumpered	C/D jumpered	No jumpers
Conner CP30344	C/D jumpered	C/D jumpered	No jumpers
Conner CFA540A	C/D jumpered	C/D jumpered	No jumpers
Quantum ELS170AT	DS jumpered	DS, SP jumpered or DS jumpered	No jumpers
Quantum LPS240AT	DS jumpered *	SP and DS jumpered *	No jumpers *
Western Digital AC1170	No jumpers	MA jumpered	SL jumpered
Western Digital AC2250	No jumpers	MA jumpered	SL jumpered
Western Digital AC2340	No jumpers	MA jumpered	SL jumpered

- \* CS (cable selection) can also be jumpered for any configuration. When CS is used, the drive is a master if pin 28 is grounded or a slave if pin 28 is not grounded.

---

## **DMA Assignments**

Level	Assigned device
DMA0	Reserved (S-bit)
DMA1	Reserved (S-bit)
DMA2	FDD controller(S-bit)
DMA3	Reserved (S-bit)
DMA4	Cascade for DMA
DMA5	Reserved (16-bit)
DMA6	Reserved (16-bit)
DMA7	Reserved (16-bit)

---

## ***Hardware Interrupts***

IRQ no.	Function
IRQ0	Timeout 0 (internal connection)
IRQ1	Keyboard
IRQ2	Cascade IRQ 9
IRQ3	Serial port 2
IRQ4	Serial port 1
IRQ5	Parallel port 2
IRQ6	Diskette drive controller
IRQ7	Parallel port 1
IRQ8	Real-time clock
IRQ9	Available
IRQ10	Available
IRQ11	Available
IRQ12	PS/2mouse
IRQ13	Math coprocessor
IRQ14	Hard disk drive controller
IRQ15	Available

---

# System Memory Map

FFFFFFh	Memory to relocate BIOS	16MB (Maximum system memory)
FF0000h		
	System memory on board	1MB
100000h		
	System BIOSROM	
0F0000h		
	Available	
0C8000h		
	VGA BIOS ROM	
0C0000h		
	Display memory	640KB
0A0000h		
	Conventional system memory: 640KB	
000000h		



---

## System I/O Address Map

Hex address	Assigned device
000 - 01 F	DMA controller 1, 8237
020 - 03F	Interrupt controller 1, 8259
022 - 024	AliM1217 configuration register
040 - 05F	Time r, 8254
060 - 06F	Keyboard controller, 8042
070 - 07F(CMOS)	Real-time clock NMI (non-maskable interrupt) mask
080 - 09F	DMA page register, 74LS612
0A0 - 0BF	Interrupt controller 2, 8259
0C0-0DF	DMA controller 2, 8237
0F0	Clearmath coprocessor
0F1	Reset math coprocessor
0F8 - 0FF	Math coprocessor
1 F0 - 1 F8	Hard disk
200 - 207	Game I/O
278 - 27F	Parallel printer port 2
2B0 - 2DF	Alternate enhanced graphicsadapter
2E1	GPIOB (adapter 0)
2E2, 2E3	Data acquisition (adapter 0)
2F8 - 2FF	Serial port 2
300 - 31 F	Prototype card
360 - 363	PC network (low address)
368 - 368	PC network (high address)
378 - 37F	Parallel printer port 1
380 - 38F	SDLC, bisynchronous 1

*System I/O addressmap (continued)*

<b>Hex address</b>	<b>Assigned device</b>
<b>390 - 393</b>	Cluster
3A0 - 3AF	SDLC, bisynchronous 2
3B0 - 3BF	Monochrome display and printerport
3CO-3CF	Enhanced graphicsadapter
3DO-3DF	Color graphics monitor adapter
3F0 - 3F7	Diskette drive controller
3F8 - 3FF	Serial port 1
6E2, 6E3	Data acquisition (adapter 1)
790 - 793	Cluster (adapter 1)
AE2, AE3	Data acquisition (adapter2)
B90, 893	Cluster (adapter2)
EE2, EE3	Data acquisition (adapter3)
1390- 1393	Cluster (adapter3)
22E1	GPIB (adapter 1)
2390 - 2393	Cluster (adapter 4)
42E1	GPIB (adapter 2)
63E1	GPIB (adapter 3)
82E1	GPIB (adapter 4)
A2E1	GPIB (adapter5)
C2E1	GPIB (adapter6)
E2E1	GPIB (adapter 7)

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## Connector Pin Assignments

### *Parallelport connector pin assignments (CN5)*

Pin	Signal	Pin	Signal	Pin	Signal
1	Strobe	10	$\overline{\text{ACK}}$	19	Signal ground
2	Data 0	11	Busy	20	Signal ground
3	Data 1	12	PE	21	Signal ground
4	Data 2	13	Select	22	Signal ground
5	Data 3	14	$\overline{\text{ALF}}$	23	Signal ground
6	Data 4	15	$\overline{\text{Error}}$	24	Signal ground
7	Data 5	16	$\overline{\text{Init}}$	25	Signal ground
8	Data 6	17	$\overline{\text{Selectin}}$		
9	Data 7	18	Signal ground		

### *Serial port connector pin assignments (CN6 and CN7)*

Pin	Signal	Pin	Signal
1	Data carrier detect	6	Data set ready
2	Receive data	7	Request to send
3	Transmit data	8	Clear to send
4	Data terminal ready	9	Ring indicator
5	Ground		

---

# **Glossary**

## ***486SLC33, SLC2-50***

Processor chips specifically designed for high-performance systems. The chips are fully compatible with the *i486* instruction set, and include a 1KB instruction/ data cache.

## **AUTOEXEC.BAT file**

A batch file that MS-DOS executes automatically each time you turn on or reset the computer. This file contains startup commands that tell the computer what to do each time you turn it on.

## **BIOS**

Basic Input/ Output System. Routines in ROM that handle the basic input/ output functions of the operating system.

## **Cache**

A high-speed memory buffer that stores frequently used data where your microprocessor can access it faster. Your computer includes 1KB of internal cache.

## **CONFIG.SYS file**

A special system file that MS-DOS executes each time you turn on or reset the computer. You use this file to customize your system by installing device drivers, setting limits for files and buffers, and specifying MS-DOS commands to be run during startup.

## **Coprocessor**

An optional integrated circuit (chip) that assists the CPU in performing certain numeric calculations faster.

## ***CPU***

Central Processing Unit. The integrated circuit (chip) responsible for integrating program instructions, performing calculations, and controlling all input and output operations.

## ***Driver***

A program that controls a specific piece of equipment in the system. Examples of drivers include expanded memory managers, display drivers, printer drivers, and mouse drivers.

## ***IDE***

Integrated Drive Electronics. A type of hard disk drive interface in which the controller is on the drive instead of on a controller card. Your computer includes an interface on the main system board for up to two IDE hard disk drives.

## ***Is4***

Industry Standard Architecture. The 8- or 16-bit bus standard developed for IBM compatible computers.

## ***Jumper***

A small moveable plug that connects two pins on a device's circuit board. Jumpers alter the operation of a particular function.

## ***Local bus***

An internal group of wires that sends information from the microprocessor directly to the video controller in the computer. Local bus video provides increased performance.

## ***Math coprocessor***

See *Coprocessor*.

**Memory module**

A small circuit board, commonly called a SIMM (single in line memory module), that contains surface-mounted memory chips. You can add memory modules to the main system board to expand your computer's memory.

**Microprocessor**

A CPU chip, such as the 486SLC. See also *CPU*.

**Numeric coprocessor**

See *Coprocessor*.

**Parallel**

A way of organizing communications between two pieces of computer equipment, in which the signals that make up each character are sent simultaneously. See also *Serial*.

**Power-on diagnostics**

A set of testing routines the computer performs automatically every time you turn it on.

**RAM**

Random Access Memory. The portion of the computer's memory that runs programs and temporarily stores data while you work. See also *ROM*.

**Real-time clock**

A battery-powered clock in the computer that keeps track of the current time and date even when the computer's power is off.

## **ROM**

Read Only Memory. The portion of the computer's memory that contains permanent instructions and cannot be modified. Unlike RAM, ROM retains its contents even after you turn off the computer. See also *RAM*.

## **RS-232C**

A standard serial interface. The computer has a connector that lets you attach an RS-232C-compatible device to your computer.

## **Serial**

A way of organizing communications between two pieces of computer equipment, in which the signals that make up each character are sent sequentially. See also *Parallel*.

## **Shadow RAM**

The function that copies the system BIOS and video BIOS from ROM into RAM to speed up performance.

## **SIMM**

*See Memory Module.*

## **VGA/SVGA**

Video Graphics Array/ Super Video Graphics Array. A high-resolution (640 x 480) display adapter standard.

## **Write-protect**

To prevent a diskette from being overwritten. When a diskette is write-protected, you cannot erase, change, or record over its contents.

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# Index

## A

- AC power inlet, 1-5, 1-7, 5-3
- Addresses, memory, 1-12, 1-16,  
    A-14-15
- Analog connector, 1-5
- Application programs
  - compatibility, A-6
  - copy protected, 2-5
  - display problems, 5-6
  - exiting, 1-9, 2-4
  - installing, 1-18
  - problems, 5-9-10
  - requiring slow speed, 1-15, 2-5
  - stopping, 2-3
  - timing requirements, 2-5
- Auto-sensing feature, 1-13, A-2,  
    A-8
- AUTOEXEC.BAT file, 5-2

## B

- Back panel
  - grounding yourself, 3-3, 3-19-20
  - ports, 1-3-4
  - removing cover, 3-2
  - serial number location, 5-2
- Battery, 1-10, 3-8, 5-12, A-2
- BIOS, Intro-1-2, 1-10, 1-12, 1-14,  
    1-16, 5-2, A-1
- Booting system, 1-1 1, 1-14, 1-17
- Bracket
  - internal and external drive bay, 3-5
- Button
  - diskette release, 2-2-3
  - power, 1-8
  - RESET, 1-8, 2-4

## C

- Cable
  - additional Y type, 4-7
  - drive, see Diskette drive or Hard  
    disk drive
  - keyboard, 1-4
  - modem, 1-6
  - monitor, 1-5
  - mouse, 1-4
  - parallel device, 1-6
  - power supply, 4-7-8,4-1 1-12,  
    4-14, 4-16-17,4-19
  - printer, 1-6
  - serial device, 1-6
- Cache memory, internal, 1-16, A-1
- CD-ROM, Intro-3,4-1, 4-10, A-4
- CGA (color graphics adapter), 1-15
- Checking system memory, 1-14
- Chip set feature control, 1-16
- CHKDSK command, 5-7
- Circuitry, electrical, 5-3
- Clock, real-time, 1-12, A-2
- CMOS RAM, 1-10, 3-8, A-2
- Color monitor, 1-15
- Colors, supported, 3-18, A-2, A-7
- COMn, 1-3, 1-6, 3-7
- Command prompt, 1-10, 1-17
- Components
  - damaging, 3-3
  - internal, 3-5
- CompuServe on-line support,  
    Intro-6
- Computer
  - features, Intro-1-4
  - physical characteristics, A-4
  - problems, 5-3-4
- CONFIG.SYS, 5-2



- Configuration
  - changing, 1-10-11, 1-17
  - drive, 4-19
  - errors, 1-11
  - files, 3-22, 5-2
  - memory, 3-10
  - SIMM, 1-14, 3-10
  - system, 5-1-2
- Connecting
  - keyboard, 1-4
  - modem, 1-6
  - monitor, 1-5
  - mouse, 1-4
  - power cords, 1-5, 1-7, 3-2, 3-4
  - printer, 1-6
- Connector
  - analog, 1-5
  - DB-9P, 1-6
  - hard disk drive, 4-5-7
  - keyboard, 1-4, 1-15
  - pin assignments, A-16
  - printer, 1-6
  - serial device, 1-6
- Contrast, 1-8, 5-5
- Control codes, 2-3-5
- Control panel settings, 5-10
- Controller
  - diskette drive, 3-7, A-2
  - errors, 5-12
  - hard disk drive, 3-8, A-2
  - jumpers, 5-12
  - parallel port, A-2
  - problems, 5-12
  - VGA, A-2
- Coprocessor, math
  - installing, 3-20-2 1
  - type, Intro-4, 1-12, 3-20, A-1
- Copy protected application
  - programs, 2-5
- Copy protected disks, see Key disk
- Cover
  - removing, 3-2-3
  - replacing, 3-4
- CPU
  - location, 3-5
  - processor type, 1-12, A-1
  - specifications, A-1
  - speed, see Processor speed
- Ctrl Alt, 2-5-6
- Customer support, Intro-5-6
- Cylinder value, hard disk drive,
  - 1-14, A-8-10
- Cyrix 486SLC, Intro-1, 1-16, A-1
- Cyrix Cache option, 1-16
- D**
  - Date, setting, 1-8, 1-12
  - DB-9P connector, 1-6
  - Depth, computer, A-4
  - Diagnostics, power-on, 1-8, 5-11
  - Dimensions, computer, A-4
  - DIP
    - chips, 3-18
    - switches, 5-11
  - Disk compaction utility, 5-9
  - Disk drive light, 1-8-9,2-3
  - Diskette
    - defective, 5-7
    - formatted, 5-7
    - inserting, 2-2
    - key, 2-5, 5-9
    - label, 2-2-3
    - problems, 5-6-7
    - release button, 2-2-3
    - removing, 1-9, 2-2
    - shutter, 2-2
    - type, 5-6
    - write-protected, 5-7
  - Diskette drive
    - bays, 1-8, 3-5, 4-1, 4-9-14
    - cable, 3-4, 3-21, 4-10, 4-12
    - configuration, 1-12, 4-19, 5-7
    - controller, 3-7, A-2
    - errors, 5-7
    - faulty, 5-6
    - indicator light, 1-8, 2-3

- Diskette drive (continued)
  - installing, 4-1-20
  - latch, 2-3, 5-6
  - power cable, 4-1 1-12
  - problems, 5-7
  - protective card, 1-7
  - release button, 2-2-3
  - removing, 4-12-14
  - types, 4-1, 4-4, A-3
- Display adapter
  - defining type, 1-14-15
  - disabling VGA adapter, 3-8
  - jumper settings, 5-6
- Display option, 1-14
- DRAM video chips, 3-18-20, A-1
- Drivers
  - mouse, 1-4, 5-5
  - printer, 5-10
  - video, Intro-2, 1-18
- Drives, see Diskette drive or Hard disk drive
- Dual inline package chips, 3-18

## E

- EGA (enhanced graphics adapter), 1-15
- Electric shock, 1-7, 3-3
- Electrical
  - circuitry, 5-3
  - outlet, 1-5-7, 5-3
- Enhanced performance, 3-1
- Ergonomic tips, 2-1-2
- Errors
  - configuration, 1-11
  - controller, 5-12
  - diskette drive, 5-7
  - hard disk drive, 5-8
  - keyboard, 5-4
  - read/ write, 5-9
  - software, 5-9-10
- Expansion slots, I/O, A-3
- Extended memory, 1-16, A-13

- External
  - device problems, 5-11
  - display adapter, 3-8
  - drive bays, 4-9-14

## F

- Factory default settings, 1-17, 3-8
- Fast processor speed, 1-15, 2-5, A-1
- Files
  - AUTOEXEC.BAT, 5-2
  - CONFIG.SYS, 5-2
  - configuration, 3-22, 5-2
  - repairing, 5-7
- Floppy disk drive, see Diskette drive
- Formatting
  - diskettes, 5-7
  - hard disk drive, 5-8-9
  - low-level, 5-8-9
- Frequency, power supply, A-5
- Full-length option slots, Intro-1, 3-15-17, A-3
- Function keys, SETUP, 1-11

## G

- Game port, 1-3, 3-7, A-3
- Graphics adapters, 1-15
- Grounding
  - plate, 4-3
  - yourself, 3-3, 3-19-20
- Guiderail, 4-3

## H

- Hard disk drive
  - auto-sensing feature, 1-13, A-2, A-8
  - bays, 3-5, 4-1-2, 4-4
  - cable, 4-5-10, 4-12, 4-14, 4-16-17, 4-19
  - compaction utility, 5-9
  - configuration, 1-13-14, 4-19
  - connector, 4-5
  - controller, 3-8, A-2
  - cylinder value, 1-14, A-8-10

## Hard disk drive (continued)

- defining, 1-13-14, A-8-10
- errors, 5-8
- formatting, 5-8-9
- indicator light, 1-8
- installing, Intro-3,4-1-20
- jumpers, 4-2-3, 5-8, A-11
- master, 4-3, A-11
- parameters, A-10
- physical format, 5-8-9
- power cable, 4-7-8, 4-11, 4-14, 4-16-17, 4-19
- problems, 5-8-9
- slave, 4-3, A-11
- types, 4-1, 4-4, A-8-10
- user-defined, 1-14

## Hardware interrupts, A-12

## Height, computer, A-4

## Help screen, SETUP, 1-11

## Help, where to get, Intro-5

## I

### I/O

- address map, A-14
- expansion slots, A-3
- port controller problems, 5-12

## IDE hard disk drive

- controller, 3-8, A-2

## Indicator light

- diskette drive, 1-8, 2-3
- hard disk drive, 1-8
- monitor, 5-6
- power, 1-8, 5-3, 5-5
- speed, 1-8, 2-5

## Inlet, AC power, 1-5, 1-7, 5-3

## Input ranges, power supply, A-5

## Internal

- cache, 1-16, A-1
- components, 3-5
- drive bays, 4-4-8, 4-14-18

## ISA wait state, 1-17, 5-11

## J

### Jumpers

- battery, 3-8
- changing settings, 3-7-9, 5-12
- CMOS memory, 3-8
- COMn, 3-7
- controller, 5-12
- diskette drive controller, 3-7
- display adapter, 5-6
- game port, 3-7
- hard disk drive, 4-2-4, 5-8, A-11
- hard disk drive controller, 3-7-8
- location, 3-5-6
- LPTn, 3-7
- option card(s), 3-15, 5-11
- parallel port, 3-7
- positions, 3-9
- problems, 5-12
- serial port, 3-7
- VGA controller, 3-7-8
- video card, 5-6

## K

### K/B port, 1-4

### Key disk, 2-5, 5-9

### Keyboard

- built-in connector, disabling, 1-15
- cable, 1-4
- checking connections, 5-4
- connecting, 1-4
- errors, 5-4
- function keys, 1-11
- Num Lock, 1-15, 5-5
- option, 1-15
- port, Intro-1, 1-4, 5-4, A-3
- problems, 5-4
- PS/2 compatible, Intro-1, A-3
- specifications, A-3
- using, 2-2

### Keypad, numeric, 1-15, 2-5, 5-5

### Keys, SETUP function, 1-11

## **L**

Local bus video, Intro-1-2, A-2

Low-level format, 5-8

## **M**

Main system board, 3-5, 3-7, 3-10, 4-5

Mass storage, Intro-1, Intro-3,4-1,  
A-3-4

Master drive, 4-3, A-11

Math coprocessor, Intro-4, 1-12,  
3-20-21, A-1

MDA (monochrome display  
adapter), 1-15

Memory

addresses, 1-12, 1-16, A-13

banks (SIMMs), 3-10

checking system, 1-14

clearing, 2-4

CMOS RAM, 1-10,3-8, A-2

configuration, 3-10

count, 1-8

extended, 1-16, A-13

installing (SIMMs), 3-10-12

insufficient, 5-9-10

map, A-13

NetWare requirements, 5-10

OS/ 2 requirements, 5-10

problems, 5-11

RAM, Intro-1-2, 1-14, 1-16,3-10,  
A-1

relocate option, 1-16

removing (SIMMs), 3-13, 3-15

reserved, 1-12

ROM, 1-10, 1-16, A-1

shadowing, 1-16

size, 1-14

standard RAM, A-1, A-13

system, Intro-1-2, 1-10, 1-14, 1-16,  
3-10, A-1, A-13

UNIX requirements, 5-10

video, see Video memory

Messages, error, 5-4, 5-6-9, 5-12

MGA (multi-mode graphics  
adapter), 1-15

Microprocessor, see CPU

Modem, Intro-2, 1-6

Monitor

assigning type, 1-15

brightness, 1-8, 5-5

cables, 1-5

color, 1-15

connecting, 1-5

contrast, 1-8, 5-5

multifrequency, 1-5

power cord, 1-5, 5-6

power requirements, 1-5

power switch, 5-5-6

problems, 5-5

turning on and off, 1-7, 1-9, 3-2

VGA port, Intro-1, 1-5, 1-14

Mouse

cable, 1-4

connecting, 1-4

driver, 1-4, 5-5

port, Intro-1, 1-4, 1-6, A-3

problems, 5-5

PS/ 2 compatible, Intro-1, 1-4, A-3

specifications, A-3

MS-DOS, 1-8-9,3-8

Multifrequency monitor, 1-5

## **N**

NetWare

memory requirements, 5-10

Network, Intro-2

Num Lock, 1-15, 5-5

Numeric

coprocessor, Intro-4, 1-12, 3-20-21,  
A-1

keypad, 1-15,2-5, 5-5

## **O**

On-line support, Intro-6

Operating procedures, Intro-4

- Operating system
  - compatibility, A-6
  - diskette, 1-7, 2-4
  - installing, 1-17
  - MS-DOS, 1-9, 3-8
  - performance, 3-1
  - reloading, 2-4
  - version number, 5-2
- Optical drive, Intro-3,4-1, 4-10
- Option cards
  - 16-bit, Intro-1
  - connector board, 3-5
  - DIP switches, 5-11
  - guidelines for using, 3-15
  - installing, Intro-2-4, 3-15-17
  - jumpers, 3-15, 5-11
  - problems, 5-11
  - removing, 3-8, 3-18
  - video, 1-14
- Option slots, Intro-1, 3-15-18, A-3
- Optional equipment, Intro-2-4, 3-1, A-7
- OS/2 memory requirements, 5-10
- Outlet, electrical, 5-3
- P**
- Parallel port
  - connector pin assignments, A-16
  - controller, A-2
  - jumper settings, 3-7
  - using, 1-6
- Pause key, 2-3
- Physical format, hard disk drive, 5-8-9
- Port
  - additional, Intro-2, 1-4
  - COMn, 1-3, 1-6, 3-7
  - connector pin assignments, A-16
  - game, 1-4, 3-7, A-3
  - jumper settings, 3-7
  - keyboard, Intro-1, 1-4, 5-4, A-3
  - location, 1-3
  - mouse, Intro-1, 1-4, 1-6, 5-4, A-3
- Port (continued)
  - parallel, Intro-1, 1-6, A-2, A-16
  - RS-232C, 1-6
  - serial, Intro-1, 1-34, 1-6, A-2, A-16
  - VGA, Intro-1, 1-5, 1-14
- Post-installation procedures, 3-22, 4-19
- Power
  - button, 1-8
  - cord, 1-7
  - inlet, AC, 1-5, 1-7, 5-3
  - light, 1-8, 5-3, 5-5
- Power supply
  - cable, 4-7-8,4-1 1-12,4-14, 4-16-17, 4-19
  - frequency, A-5
  - input ranges, A-5
  - location, 3-5
  - maximum outputs, A-5
  - type, A-5
- Power-on diagnostics, 1-8, 5-11
- Precautions, safety, iii-iv, 1-7, 3-1, 3-3, 3-19, 3-21
- Printer
  - cable, 1-6
  - checking connections, 5-10
  - connecting, 1-6
  - drivers, 5-10
  - problems, 5-10
- Processor speed
  - changing, 1-15,2-5-6, A-1
  - CPU, 1-15
  - fast, 1-15, 2-5, A-1
  - keyboard command, 2-5
  - problems, 5-9
  - SETUP, 1-15, 2-6
  - slow, 1-15, 2-5, 5-9, 5-11, A-1
- Processor type, 1-12
- Protective card, 1-7
- PSI 2 compatible
  - keyboard, Intro-1, A-3
  - mouse, Intro-1, 1-4, A-3

## R

- RAM, A-1
  - shadow, Intro-1-2, 1-16, A-1
  - standard, Intro-1, 1-14, A-1
  - video, A-1
- Read/ write
  - errors, 5-9
  - slot, 2-3
- README.TXT, Intro-2, 1-18
- Real-time clock, 1-12, A-2
- Release button, diskette, 2-2-3
- Relocate memory option, 1-16
- Repairing files, 5-7
- Replacing cover, 3-4
- Reserved memory, 1-12
- RESET button, 1-8, 2-4
- Resetting computer, Intro-4, 1-15;  
2-4, 5-1
- Resolutions, video, 3-18, A-2
- ROM, 1-10, 1-16, A-1
- RS-232C ports, 1-6, A-2

## S

- Safety precautions, iii-iv, 1-7, 3-1,  
3-3, 3-19-20
- SCANDSK command, 5-7
- Screen colors, 3-18
- Screen resolutions, A-2
- Serial number, 5-1-2
- Serial port
  - COMn, 1-3, 1-6, 3-7
  - connector, 1-6
  - connector pin assignments, A-16
  - controller, A-2
  - interface, A-2
  - reassigning, 3-7
  - using, 1-6
- SETUP
  - auto-sensing feature, 1-13
  - changing processor speed, 1-15, 2-6
  - changing values, 1-12
  - chipset feature control option, 1-16
  - date and time, 1-12

## SETUP (continued)

- diskette drive, 1-12, 5-7
- exiting, 1-17
- factory default settings, 1-17
- function keys, 1-11
- hard disk configuration, 1-13-14
- help screen, 1-11
- ISA 1 wait state option, 1-17, 5-11
- keyboard option, 1-15
- num lock function, 1-15, 5-5
- processor speed, 1-15, 2-6
- relocate memory option, 1-16
- saving settings, 1-17
- slow refresh option, 1-17
- starting, 1-10
- video display type, 1-14-15
- Shadow
  - BIOS ROM, 1-16
  - RAM, Intro-1-2, A-1
  - video ROM, 1-16
- Shadowing memory, Intro-2
- SIMMs
  - banks, 3-10
  - configuration, 1-14, 3-10
  - installing, 3-10-13
  - location, 3-5
  - removing, 3-13-15
  - sockets, 3-10-15
  - type, 3-10, A-1
- Slave drive, 4-3, A-11
- Slot cover, 3-16-18
- Slow processor speed, 1-15, 2-5,  
5-9, 5-11, A-1
- Slow refresh option, 1-17
- Speaker, A-3
- Specifications, A-1-16
- Speed, see Processor speed
- Speed indicator light, 1-8, 2-5
- Stopping a command or program,  
2-3-4
- Support, Intro-5-6
- SVGA, see VGA

## Switches

- DIP, 5-1 1
- voltage selector, 1-2-3

## System

- BIOS, Intro-2, 1-10, 5-1-2, A-1
- board, 3-5, 3-7, 3-10, 4-5
- booting, 1-11, 1-14, 1-17
- checking memory, 1-14
- configuration, 5-1-2
- identifying, 5-1
- memory, Intro-1-2, 1-10, 1-14, 1-16, 3-10, A-1, A-13
- startup information, 5-2

## System options

- auto-sensing feature, 1-13
- cache, 1-16
- chip set feature control, 1-16
- CPU speed, 1-15
- drive type, 1-14
- ISA 1 wait state, 1-17
- keyboard, 1-15
- memory relocation, 1-16
- NumLock on at boot, 1-15
- shadow RAM, 1-16
- slow refresh, 1-16

## T

- Tape drive, Intro-3,4-1, 4-10, A-4
- Technical support, Intro-5-6
- Time, setting, 1-8, 1-12
- Timing requirements, application programs, 2-5
- Troubleshooting, 5-1-12
- True Color support, Intro-1, A-7
- Turning off computer, 1-9, 3-2
- Turning on computer, 1-7

## U

- UNIX memory requirements, 5-10
- User-defined hard disk drives, 1-14

## V

### VGA

- built-in settings, 3-8
- controller, A-2
- drivers, Intro-2, 1-18
- interface, A-2
- jumper settings, 3-7
- port, Intro-1, 1-5, 1-14
- utilities, Intro-2, 1-18

### Video

- BIOS, Intro-1-2, 1-10,5-2, A-1
- card jumpers, 5-6
- controller, A-2
- display options, 1-14
- DRAM chips, 3-17-20, A-1
- drivers, Intro-2, 1-18
- jumper settings on card, 5-6
- local bus, Intro-1-2, A-2
- resolutions, 3-18, A-2
- ROM, 1-16

### Video memory

- adding, 3-18-20
- chips, 3-5, 3-18-19, A-1
- location, 3-5
- ROM shadowing, 1-16
- sockets, 3-19
- supported resolutions, A-7
- type, 3-18, A-1

### Voltage selector switch, 1-2-3

## W

- Wait state, ISA, 1-17, 5-11
- Weight, computer, A-4
- Width, computer, A-4
- Windows, 1-4, 1-9, 1-18, 5-2, 5-5
- Work environment, 2-1-2
- Write-protection, 5-7

## Y

- Y cables, 4-7

## Z

- Zero wait state, 1-17

---

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